

THE AUTHOR

Self-portrait taken with a telephoto lens on a miniature camera and enlarged from a small portion of the resulting 1½ by 1 inch negative

AMATEUR PHOTOGRAPHY IN INDIA

BY 'REFLEX'

ILLUSTRATED

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Note.—I am indebted to Messrs. Carl Zeiss, E. Leitz, J. H. Dallmeyer and Franke and Heidecke for permission to reproduce certain of the above illustrations

PREFACE

Part of the contents of this book appeared in the *Illustrated Weekly of India*. I had been impressed with the lack of up-to-date information on modern photography in the tropics. Photographic conditions in this country are so different from those encountered in temperate climates that much information contained in English books and periodicals is, of necessity, misleading or inadequate. It seemed a real misfortune that the outstanding talent existing amongst amateur photographers in India should be deprived of the fullest encouragement and help. The flattering reception accorded to my articles led me to believe that my efforts in this direction were of value.

Much additional information has been incorporated in this book. Under the appropriate headings will be found details of many of the latest types of camera; wherever possible, the Indian price, and the name and address of the importers, have been given. The same applies to the photographic accessories to which I have drawn attention. It will be appreciated that my recommendation of any particular product does not necessarily imply superiority over others in the same class. Even the keenest photographer cannot hope to try out all the wide range of accessories, films, plates and papers, available today. I have therefore been obliged to confine my remarks to those products that my own experience has proved to be particularly suited to Indian conditions.

Special attention has been paid to miniature cameras, instruments that cater so well for the needs of the average amateur that they have already attained wide popularity. Not only is a complete section devoted to describing cameras of this type but in practically every

chapter reference has been made to the application of miniature cameras to any particular branch of photographic work in India. The index at the end of the book (which I have been at pains to make as comprehensive as possible) will enable these references to be found at once

Such recent developments as colour and infra-red photography, both of particular interest in India are dealt with in Chapter IX. Room has been found in the succeeding chapter for some notes on cinematography in India, which may, I hope, be useful, to the increasing number of amateur ciné workers in this country.

My thanks and acknowledgments are due to the Editor of the *Illustrated Weekly of India* for his courtesy and encouragement when this project was first mooted, and also to the following for their unfailing kindness in supplying me with information etc —

Messrs Adair, Dutt & Co, Ltd, Bombay, Calcutta and Madras; Messrs Agfa Photo Co, Bombay, Calcutta, Delhi and Madras; Messrs Baird & Tatlock (London), Ltd., Calcutta, Messrs Eastern Electric and Engineering Co. Bombay, Messrs Hague Theatres Ltd, Bombay, Messrs Houghton-Butcher (Eastern). Ltd, Bombay and Calcutta, Messrs Kodak, Ltd, Bombay, Calcutta, Madras and Lahore Messrs Mangalbhoj & Co, Bombay and Calcutta, Messrs Schering-Kahlbaum (India), Ltd, Bombay, and Messrs Wellington & Ward, Ltd. Bombay and Calcutta.

April, 1935

‘ Reflex ’

CHAPTER I.

INTRODUCTION.

Amateur photographers in India have not been slow to take advantage of the amazing progress made in the manufacture of cameras and accessories during the last few years. This is proved by the high standard, both technically and pictorially, of the prize-winning entries in newspaper competitions.

But that there is still considerable room for improvement would be readily confirmed by competition judges, who have a tedious job in sorting out the few good "snaps" from the many indifferent ones regularly submitted to them.

Like any other scientific pursuit, photography, even in its most elementary applications, demands a mathematical precision of thought and action if consistently good results are to be obtained. This is sometimes overlooked by amateurs and disappointment inevitably follows. Whereas a little more care, allied, perhaps, with a greater knowledge of the camera's capabilities, would turn many of the failures into success.

Study of this little book will prove how easily precision methods can be learned. Once they have replaced the casual, "hope for the best" methods of the past, the amateur photographer in India will find how much more interesting his hobby becomes. Further knowledge will be absorbed without conscious effort. To understand is to learn. The reason why so

many amateurs never get beyond the slap-dash "trigger puller" stage is because they never take the trouble to find out how a camera works.

From the financial point of view alone, it is well worth an amateur photographer's while to master his subject. I have come across beginners who were pleased if they got a couple of successful "snaps" out of an 8-exposure film. Apart from the constant disappointments, and the uncertainty of never knowing whether a much sought-after "snap" will turn out well, think of the wastage of money this involves !

Then again, quite a considerable sum of money can be saved by the keen amateur who does his own developing, printing and enlarging. The proficient amateur photographer can, moreover, often find opportunities for earning money by contributing pictures to the papers or by undertaking other commercial work.

Those who are ambitious to win prizes in competitions, or to have their work exhibited, will find that the assimilation of the precision principles set out in this book will greatly enhance their chances of success

Chapters III and IV contain the essentials upon which successful amateur photography in India is founded. They will, I think, repay attention from all amateurs in this country, whatever their status and experience. They contain as little scientific theory as is consistent with explaining the many problems that confront the amateur in India. That theory I have taken care to express in simple unscientific language. I do not think that the veriest novice will find difficulty in understanding it. Certainly he need not be alarmed at the prospect.

The reluctance of many amateur photographers to learn the essentials of their subject is difficult to account for. No one would attempt to play tennis, to collect butterflies, or to shoot tigers, without learning what to do and how to do it. Possibly the prevalent idea that photographic theory is difficult and dull explains why amateur photographers are so frequently content with a poor return for their expenditure of money, time and trouble.

This book, I hope, will prove that the little theoretical knowledge required by the amateur photographer in India is both simple and interesting. If the reader can manage to start off by forgetting his prejudices against scientific theory, then I think we shall get on very much better together. He will be in a receptive mood for the small amount of theory required to ensure intelligent understanding of the practical problems we discuss.

So much for those who have already taken up the hobby of amateur photography. For those who are thinking of doing so, or for those who are conscious of something lacking in their lives and want a hobby to occupy their leisure hours, I hope that this book may be of particular value. In its pages will be found the essence of my own study and experience since beginner days on a lonely tea garden. It will be seen that amateur photography in India need not be an expensive hobby. Twenty or thirty rupees will buy a fully efficient camera. Another ten rupees is sufficient for the accessories required for home developing and printing. The cost of running a popular-size camera need not work out at more than three annas a picture.

For this small expenditure of money we have a hobby that not only provides an outlet for man's creative instinct but is available as an almost universal antidote for loneliness, boredom and depression. If more people would devote their surplus energy to such a hobby as amateur photography, this India of ours would be a happier and more contented country.



“ SUSIE ”

4 p m , shaded Indian sunshine,
f 6 3, 1/25 sec “Snapped” with
a cheap camera fitted with portrait
attachment



'BRUNETTE "

An example of serious
portraiture with a cheap
box camera

CHAPTER II.

MODERN HAND CAMERAS.

The very wide range of hand cameras on the market today may be grouped into four classes. First of all we will consider the box type of film camera that retains great popularity with amateur photographers in India and abroad.

These cameras are in box form with a fixed-focus single, or doublet, lens and a simple type of diaphragm shutter, permitting instantaneous and time exposures, the former in the hand and the latter, of course, on a tripod. No focussing of the lens is necessary as objects from short distances to infinity are sharply defined. For portraits, supplementary lenses can be fitted, or built-in focussing adjustments made use of, and the results are surprisingly good. For children and beginners they provide a splendid training in elementary work.

That their scope is limited will be readily appreciated. The lenses of these cameras are of small aperture, f. 11 or f. 16 (which means that the diameter of the lens is but 1/11th or 1/16th of the focal length, or distance at which the lens is placed from the film) and are therefore slow. With a shutter giving instantaneous exposures of 1/25th sec., snapshots can only be taken in bright sunshine. In India, however, the light is often too brilliant and over-exposure becomes a real danger. With some of the latest box cameras it is possible to decrease the aperture of the lens to compensate for over-strong light. Nevertheless, users of these

cameras in this country usually find that the best "snaps" are taken before 9 in the morning, and after 4 o'clock in the afternoon, when the light is less harsh.

Typical models are* —

Zeiss Ikon "Box-Tengor." Adair, Dutt & Co., Ltd., Bombay, Calcutta and Madras.

An all-metal camera, with f. 11 lens and built-in supplementaries for close-ups, operated by a simple lever. A good model is that taking 16 V.P. pictures on $3\frac{1}{4}$ by $2\frac{1}{4}$ in film at Rs. 17.

Kodak "Brownie." Kodak, Ltd., Bombay, Calcutta, Madras and Lahore.

There are several attractive models in the well-known Kodak "Brownie" series. The two new "Six-20 Brownies," $3\frac{1}{4}$ by $2\frac{1}{4}$ picture size, fitted with doublet lenses at Rs. 10 and Rs. 18 respectively, with focus adjustment for close-ups, are splendid instruments for the beginner.

Agfa "Box Special." Agfa Photo. Co., Bombay, Calcutta, Delhi and Madras. Although there are Agfa models costing no more than Rs. 4, this camera at Rs. 15 is well worth the extra money. It takes the popular $3\frac{1}{4}$ by $2\frac{1}{4}$ inch picture, and has a faster lens, which is adjustable for objects at various distances.

More efficient instruments for all-round work in India are the numerous makes of folding film and plate cameras. Fitted with anastigmat lenses of apertures

*Prices of cameras and accessories in this and subsequent chapters are included so that readers may have every assistance in the choice of new apparatus. It should be noted, however, that, as Indian price changes not infrequently occur, the quotations given must only be regarded as approximately correct.

up to f. 4 5, and automatic diaphragm shutters, working between the component lenses and giving exposures from 1 sec. up to 1/250th, in certain models, such cameras are almost independent of lighting conditions and can be relied upon to give excellent results under any normal circumstances.

Typical models are :—

Kodak "Six-20 Junior." Kodak, Ltd.

Takes $3\frac{1}{4}$ by $2\frac{1}{4}$ inch pictures, focussing anastigmat lenses, springs open at the touch of a button. Special, or "Kodon", shutter, giving speeds up to 1/100th sec. Prices range from Rs. 30 to Rs. 45.

Agfa "Speedex I." Agfa Photo. Co.

Another attractive $3\frac{1}{4}$ by $2\frac{1}{4}$ inch model, with f.8·8 or f.7·7 anastigmat and shutter giving exposures of 1/25th, 1/50th, 1/100th, Brief and Time Prices, Rs. 36 or 45 according to lens.

Ensign "Selfix 20." Houghton-Butcher (Eastern) Ltd., Bombay and Calcutta.

Similar in design and operation to the models above. A very sturdy camera that will withstand rough usage. Accurate focussing by rotating mount. A good model is that with f. 6·3 "Ensar" anastigmat at Rs. 45.

Ihagee "Auto-Ultrix." Mangalbhooy & Co., Bombay and Calcutta.

A strongly made self-erecting camera that will take plates as well as films and is available in $3\frac{1}{2}$ by $2\frac{1}{2}$ inch and V. P. sizes. The lenses range from f. 6·3 Ihgaee anastigmat in "Vario" shutter to the famous f.4·5 Zeiss "Tessar" in Compur shutter giving speeds up to 1/250th sec. Prices are from Rs. 36 to Rs. 135 according to size and lens.

Voigtländer "Bessa." Schering-Kahlbaum (India) Ltd., Bombay.

Two models are made in this series. The $3\frac{1}{4}$ by $2\frac{1}{4}$ inch model will suit the majority of amateurs. It is fitted with f. 6.3 "Voigtar" anastigmat in special shutter with speeds up to 1/100th sec. Has the well-known "Three Point Focussing" which enables the beginner to secure sharp pictures with the minimum of trouble. Very reasonably priced at Rs. 54

Zeiss Ikon "Nettar." Adair, Dutt & Co.

Amongst the many Zeiss Ikon folding cameras the "Nettar" is a popular-priced model at Rs. 48, with f.6.3 anastigmat lens in automatic shutter giving speeds up to 1/100th. Very good workmanship, fully worthy of the Zeiss Ikon tradition

These are cameras that will appeal to the Indian amateur who is not prepared to pay a very high price for his instrument. For Rs. 30 to Rs. 50 one has a wide range of choice. Now we will mention a few of the more expensive folding film and plate cameras, specially suited to Indian conditions

Zeiss Ikon "Ikonta" Adair, Dutt & Co.

There are many models in this range, at prices from Rs. 29 to Rs. 195 for the latest "Super-Ikonta," with automatic range-finder, that dispenses with distance-judging and enables even the beginner to secure sharp pictures on all occasions. This, of course, is a tremendous advantage, well worth paying for. For those who cannot afford the price of the "Super-Ikonta," a good model is the $3\frac{1}{4}$ by $2\frac{1}{4}$ "Ikonta" with f.4.5 "Novar" lens in Compur shutter at Rs. 111.

For those who prefer to use plates, *Zeiss Ikon* market several attractive cameras, including the well-known luxury outfit, the "Tropical Adoro," costing Rs. 260 in the $3\frac{1}{2}$ by $2\frac{1}{2}$ size. This camera is specially made to resist damp and heat, and will appeal particularly to the advanced amateur in this country. It is fitted with Zeiss "Tessar" lens.

Vorglander have several superb outfits in the more expensive class, including the "Prominent," a marvel of constructive ingenuity with its automatic range-finder and built-in exposure meter, at Rs. 295. And several beautifully-made plate cameras, including the double-extension "Avus" at Rs. 110 to Rs. 164 according to lens and shutter. For this camera, and the "Tourist", tele lenses are available to interchange with the normal objectives, the world-famous "Heliar" or the very efficient "Skopar" anastigmats.

Ihagee market many plate and film cameras at prices between Rs. 50 and Rs. 200. A special tropical plate model is the "Neugold" excellent workmanship and available in three sizes at prices from Rs. 200 to 300.

Agfa are equally go-ahead in their manufacturing and designing policy. For the amateur who wants a high-speed lens there is the "Speedex O", with f 3.9 lens in Compur shutter at Rs. 110. While the *Agfa* "Isolar" plate and film-pack camera will appeal to many more advanced workers at its price of Rs. 170.

And then there is *Kodak*, who market many cameras at all prices from Rs. 55 for the "Series III" with f.7.9 lens to Rs. 220 for the "No 1 Special" with f.4.5 lens. The *Kodak* slogan has always been reliability and ease of operation, and their instruments are always a safe investment.

Ensign, and other firms, also market many cameras in India. The foregoing notes will give the prospective purchaser some idea of the prices ruling at the present time. He will be well-advised to apply for catalogues, however, before deciding on the most suitable instrument for his special requirements

Then we come to folding focal-plane and reflex cameras. Both these types are fitted with focal-plane shutters—a blind, with adjustable slit, that moves across the film face when the exposure is made. These focal-plane shutters can be constructed to give a far wider range of speeds than is possible with even the most perfect shutters of the diaphragm type. With speeds of $1/500$ th, $1/1000$ th, or even $1/2000$ th of a second, one can secure high speed photographs that are impossible with any other design of instrument. For serious workers, contributors of pictures to the papers and magazines, exploration, wild animal photography and commercial work, these larger cameras, fitted with focal-plane shutters, retain their popularity. The reflex is ideal for views and portraiture, the folding focal-plane for speed work and press photography.

We will deal with the reflex first. These cameras are constructed in such a way that one can see the actual picture on a ground-glass focussing screen before exposure. The mechanism of the shutter and the mirror is coupled together in such a way that the latter springs up out of the way when the trigger is operated. The advantages of the reflex arrangement are great. Not only is there no distance judging but the appearance of the actual picture on the screen enables the photographer to study composition and pictorial effect with the greatest ease. For pictorial

workers in India, a $3\frac{1}{2}$ inch by $2\frac{1}{2}$ inch plate and film-pack reflex of good make is still hard to beat. Greater bulk and weight is made worth while by the greater accuracy in working.

Typical reflex camera models are :—

Ensign "Speed Film Reflex." Houghton-Butcher (Eastern), Ltd.

A small reflex model built for the amateur who prefers roll films. First-class f.4.5 or f.3.4 lens. Special tropical model A thoroughly reliable camera at a reasonable price Prices. Tropical model, £9/10 to £16/10 (English price), according to lens.

Thornton-Pickard "Ruby Horizontal Reflex." Messrs. Thornton-Pickard, Altrincham, England. A thoroughly satisfactory camera made by a firm of international repute. Available with any of the best-known lenses like Zeiss "Tessar", Ross "Xpres" or the super-speed Dallmeyer "Pentac". Light weight and small size self-capping focal-plane shutter giving speeds from 1/10th to 1/1000th. Prices range from £8/15, with Dallmeyer f.4.5 lens, to £18/10 with f.2.9 "Pentac"

Messrs. Thornton-Pickard make many other reflex models at all prices and with all sorts of the latest refinements in construction and design The advanced amateur who thinks of buying a camera of this type cannot do better than write to them for full particulars.

Messrs. Soho, Ltd., and *Messrs Newman and Guardia* are two other English firms who have the highest reputation for reliability and excellence. Full particulars can be obtained about their cameras from any of the English dealers listed at the end of this chapter in the section dealing with second hand instruments.

Messrs Zeiss Ikon market the well-known "Miroflex" folding reflex about which *Adair, Dutt & Co.* will give full particulars. This is a remarkable instrument, combining reflex advantages with the suitability of the folding focal-plane type for speed work. By a simple adjustment, the camera can be made to operate either as a reflex or as a so-called press camera. The special focal-plane shutter has speeds from $1/3\text{rd}$ to $1/2000\text{th}$ sec., which are controlled by one milled ring at the side of the camera. Prices range from Rs. 565 upwards, according to size of Camera and lens.

Messrs. Ihagee also make several attractive folding reflex models. *Mangalbhoj & Co.* will give full particulars.

Then there are the well-known Kodak "Graflex" series. The latest addition to the series is the "National Graflex," taking 10 pictures on $3\frac{1}{4}$ by $2\frac{1}{4}$ roll film. It is a remarkably neat outfit, costing Rs. 390. There are other "Graflex" cameras in all sizes, at all prices.

Readers need not be appalled at the high prices mentioned above. I have given some indication of what reflex cameras cost, to guide the prospective purchaser. It does not follow that reflex cameras cannot be obtained for very much less. We shall have more to say on this subject when we come to talk about buying second-hand.

Lastly, there are the folding focal-plane instruments. To the really enthusiastic amateur they are entirely satisfactory and we only have to look through the picture pages of any newspaper to see what cameras of this type can do. They do, however, demand skill

in operating. Distances must be accurately judged. For this reason they are not suitable for inexperienced photographers.

Folding focal-plane, or press cameras, are manufactured by the majority of the leading firms. They run from Rs. 250 to Rs. 500, for a $3\frac{1}{2}$ by $2\frac{1}{2}$ or $\frac{1}{4}$ -plate instrument with a first-class lens. *Ihagee*, *Zeiss Ikon*, *Thornton-Pickard* and others all market entirely satisfactory instruments of this type. Telephoto lenses can be bought to interchange with the normal lens fitted and are often the means of securing fine long-distance pictures.

There is one type of folding focal-plane camera that is of particular value to the keen amateur. It could be used with advantage by a far larger number of photographers than is the case at present, either as a night snapshot camera or as a pocket instrument to carry everywhere. It is often the best competition and press "snaps" that crop up at the most unexpected times, and in the most unexpected places. I refer to the V.P. folding focal-plane instruments, that take $4\frac{1}{2}$ by 6 cms. plates and film-packs, and are fitted with super-speed lenses.

I have had one of these little cameras for some years now. It goes everywhere with me, and very often has to deputise for my larger camera. This it does with complete success. For the advanced amateur it takes the place of a little V. P. film camera. The plates are a great advantage to my way of thinking and then there is the focal-plane shutter with its wide range of speeds up to $1/1000$ th sec. High speed subjects, interior work, night "snaps"—there is practically no class of subject that it cannot tackle. The $4\frac{1}{2}$ by 6 cms.

picture size is very suitable for enlarging and does not put such a strain on the negative as is sometimes the case when working with miniature ciné film outfits. Yet these remarkable little cameras weigh no more, and take up no more space in the pocket, than many miniature instruments.

I know of three perfectly made little cameras of this type and I can recommend all of them to the advanced amateur looking out for a pocket camera that will tackle any type of work. They are:—

Dallmeyer "Speed" Camera. Messrs Baird & Tatlock.

The V. P. model is easily carried in the pocket. It is an exact replica of the larger models that are much used for press work. Lens is the "Pentac"—f.2.9, perfect definition. Shutter—self-capping, focal-plane with speeds of $1/8$ th to $1/1000$ th. Interchangeable f.5.6 "Dallon" telephoto lens—one of the best tele-lenses manufactured. Indoor snapshots are possible and night and rapid action work is much simplified when we are using a lens of this aperture. English price £18/18, tele-lens £8 extra. Altogether a very sound proposition.

The other two cameras of this type are *Zeiss Ikon* models. The first is the V. P. model of the "Nettel," a well-known press and high speed instrument. Lens is either f.4.5 or f.2.7 "Tessar" and shutter is speeded from $1/3$ rd to $1/1200$ th sec. Very good workmanship. Price: Rs 506 with the f.2.7, "Tessar".

Then there is the remarkable *Zeiss Ikon "Ermanox,"* with f.1.8 "Ernostar" lens, focal-place shutter $1/12$ th to $1/1000$ th. With such an enormous aperture lens as this, theatre and night pictures of rapidly moving subjects are possible. Definition even at full aperture

is excellent and the workmanship of the camera is of the highest class. According to *Adair, Dutt's* latest price list, this camera is sold by them in India at the very reasonable price of Rs. 445.

For all the cameras mentioned in this chapter useful accessories are available. A stout leather case is an absolute necessity for even the cheapest camera in India. A lens hood and a medium yellow filter are most desirable. A tripod, of the metal telescopic type, obtainable at reasonable prices from all the leading dealers in India, is very useful. Beyond this, the number of accessories is ruled by the depth of the photographer's purse. Personally I would not be without my tele-lenses for anything. Then there are exposure meters and all sorts of other gadgets that provide fascinating reading in dealers' catalogues. One has to acquire them gradually.

2. MINIATURE INSTRUMENTS.

The type of camera with which we will deal now is an entirely recent innovation. When Messrs. Leitz, the famous German optical firm, brought out the first model of their "Leica" camera, taking photographs on ciné film, $1\frac{1}{2}$ by 1 inch, in 1925, few photographers realised the influence that this would exert on photography as a whole. Now, only ten years later, there are an immense number of these miniature cameras, and new models are constantly being placed on the market.

In the less expensive types, these cameras are small-scale reproductions of the ordinary $2\frac{1}{4}$ by $3\frac{1}{4}$ inch roll-film folding camera. They produce negatives $1\frac{1}{4}$ by

1½ ins., and take 16 pictures on an 8-exposure V.P. film. Then there are the V. P. cameras, many of them fitted with reflex mirrors and hoods, so that the actual picture to be taken can be seen on the ground-glass screen before exposure; others of the normal folding type with direct vision finder and lens adjustment for sharp focussing for near objects. All can be obtained with large aperture lenses of wonderful speed and defining power.

A miniature or a normal sized instrument? This is a problem that confronts the amateur photographer today. It is a difficult question to answer. Miniature cameras can be fitted with lenses of such extreme aperture that night, or even stage scenes, can be snapped at 1/50th sec., and, owing to the short focal length of such lenses, the depth of focus at normal distances still remains good enough to avoid blurred backgrounds. Such instruments are easily portable, usually pocketable in fact, and a perfect "Leica," or half V.P., negative, enlarged to whole plate, is indistinguishable from a photograph taken with a ¼ plate camera.

A *perfect* negative! That is the point. Unfortunately, even with the greatest care, not all the negatives will be perfect. The human factor has to be considered and there are sometimes tricks of lighting, etc., that are bound to introduce an element of uncertainty. And, of course, it is always the most important subjects that turn out badly!

"Leica," or half V. P., negatives, unenlarged, are useless, for the human eye cannot absorb the immense amount of microscopic detail they contain. They must be enlarged, at least to ¼ plate size. An

indifferent "Leica" negative will not stand this degree of enlargement, whereas a $\frac{1}{4}$ -plate negative has to be very poor indeed not to give a passable contact print

Then, again, there are certain subjects, a small but nevertheless important class of architectural studies, for which miniature cameras, are definitely unsuitable. And again no experienced photographer will deny that a long roll of miniature negatives presents far greater difficulties in development, etc., than, for instance, plates, each one of which can be given individual attention to suit its needs.

As regards the reputed low running cost of these miniature instruments, much misapprehension exists. As stated already, an enlarger, and the cost of running it, becomes a necessity to a miniature photographer. It is only in the cost of negative material that any saving is entailed.

Even this saving is not very great. A roll of 36 "Leica" or "Contax" negatives costs about the same as 18 $\frac{1}{4}$ -plates or 3 8-exposure films, $2\frac{1}{4} \times 3\frac{1}{4}$ ". Half V. P. cameras do admittedly save a little more.

Portability is, however, an important point when much travelling is done. In these circumstances, many experienced amateurs prefer the less certain results obtainable with a miniature instrument

For, whatever may be said to the contrary, there is not the slightest doubt that miniature photography does demand greater attention to detail at every stage of the picture-making process than when working with larger cameras. Beginners are very frequently disappointed with the results obtained with even the most costly miniature instruments. They do not possess

sufficient experience to be able to employ the precision methods of working that are absolutely necessary if good results are to be attained. For this reason I do not advise the tyro to buy a camera smaller than V.P., not, that is, if he is ever going to require big enlargements from his negatives. And there is another very important point. Competition is so fierce in the miniature camera market, and price cutting so intense, that a few manufacturers are inclined to sacrifice quality to cheapness. By no means all the miniature instruments being sold now will live up to their makers' claims. For this reason it is essential for the amateur to choose his miniature camera with the greatest care. Buy only from well-known firms and be prepared to pay a fair price for your instrument. Only in this way can disappointment be avoided.

We will now review a few typical miniature models, available in India. They have been chosen with care and can all be relied upon to give good service, provided the amateur possesses the knowledge and experience to take full advantage of their capabilities.

Zeiss Ikon "Baby Box Tengor". Adair, Dutt & Co.

The cheapest miniature camera on the market. It is a good instrument for the beginner who means to specialise in miniature photography. Built in the usual box form, taking 16 pictures on V. P. film and fitted either with f.11 or f.6.3 lens. Prices: Rs. 12 to Rs. 23.

Zeiss Ikon "Baby Ikonta." Adair, Dutt & Co.

Another reasonably priced model. Sturdy construction, all-metal, self-erecting when button is pressed. Available with various lenses at prices from Rs. 44

to Rs. 145. Also takes 16 3 by 4 cms. pictures on V. P. film.

Ensign "Midget." Messrs, Houghton-Butcher (Eastern), Ltd.

This little model is proving very popular in England. Can be carried in the pocket like a watch. Measures only $1\frac{3}{4}$ by $3\frac{1}{2}$ by $\frac{3}{4}$ ins. and weighs $5\frac{1}{4}$ ounces. 3 by 4 cm. pictures on special film. Crisp pictures capable of considerable enlargement. Prices, including leather slip-case: Rs 22/8, with all-distance lens, and Rs. 37/8, with f 6.3 anastigmat, focussing to 3ft.

"Foth-Derby Combination Camera." Messrs. Mangalbhoy & Co

This is the speed miniature for the modest purse Takes 3 by 4 cm. pictures on V.P. film. Focal-plane shutter with speeds up to $1/500$ th sec. Direct-vision finder. Therefore suitable for any high-speed work. Prices: Rs 75 with f.3.5 lens and Rs. 100 with f.2.5 lens. A special enlarger is also available at Rs. 75.

Nagel "Pupille." Messrs. Kodak, Ltd.

Precision camera taking same pictures as the preceding High quality lenses of f.3.5, f.2.8 and f.2 apertures. The last is excellent for night pictures. Highest quality construction and workmanship. Compur shutter. Prices : from Rs. 177 to 265 according to lens.

Nagel "Vollenda." Messrs. Kodak, Ltd.

A similar camera to the preceding. Weight only $11\frac{1}{2}$ ounces. Self-erecting, direct-vision finder. Prices : from Rs. 55 to 185, according to lens.

Kodak "Retina." Messrs. Kodak, Ltd.

A recent and remarkable addition to the Kodak range. Takes 36 pictures on a roll of 35 mm. ciné film, each picture measuring $1\frac{1}{2}$ by 1 inch, the "Leica" size. Film advised is the Kodak "Panatomic"—36 exposures for Rs 3-8. Small and beautifully finished. F.3.5 Schneider "Xenar" lens in 8-speed Compur shutter And all this at the remarkable price of Rs. 105

Voigtlander "Perkeo." Messrs Schering-Kahlbaum (India), Ltd

Another very neat 3 by 4 cms camera Focussing is done by operating a scaled disc at side of the camera, and this can be set before opening the instrument. Self-erecting on the pressure of a button. Usual excellent Voigtlander workmanship. Fitted with f.4.5, or 3.5, anastigmats of the highest grade. The model with "Heliar" f.3.5 lens at Rs. 148 appeals to me particularly because of the wonderfully sharp and vibrant enlargements obtainable. Other models are priced at Rs. 83 to 125.

Ihagee "Weeny Ultra." Messrs. Mangalbhoj & Co.

A practical little instrument weighing only 14 ounces 16 pictures on V. P. film. Patent double threaded helical lens mount focussing down to 20 inches. No bellows; all metal construction. "Pronto" or Compur shutter Wide range of quality lenses, including Schneider "Xenon" f.2, a splendid lens for night pictures Altogether a most appealing little instrument at a moderate price Prices: from Rs 50 to Rs. 168* for f.2 lens model

*Due to exchange fluctuations, the prices of many German Cameras in India do not remain constant The figures quoted here should only be regarded as approximately correct

Zeiss Ikon "Super Nettel". Adair, Dutt & Co.

A recent innovation, the miniature brother of the well-known series of "Nettel" focal-plane cameras. Takes 36 exposures on ciné film. Metal, weather-resisting focal-plane shutter with speeds up to 1/1000th sec. This shutter is entirely reliable in India. Automatic focussing by means of coupled range-finder. A precision instrument of the highest class. Prices. Rs.280, with f.3.5, and Rs. 310, with f.2.8, Zeiss Tessar lens

Leitz "Leica." Messrs. Baird & Tatlock, Ltd.

Here is the pioneer of miniature photography and one of the two most remarkable miniature cameras on the market. These cameras are world-famous; enlargements from the ciné film negatives they produce not infrequently figure on the picture pages of the newspapers in all countries. It is impossible in a short space to deal with these instruments in detail. We can only give a short description of a few of the most remarkable features and refer the reader for further information to Messrs. Baird and Tatlock.

The "Leica" will go in the pocket, is fitted with an accurate range-finder, coupled to the lens mount. This reduces focussing to simplicity. All the operator has to do is to rotate the lens mount until the twin images in the range-finder merge into one when he can be certain of the sharpest possible focus. The shutter is focal-plane, heat, damp and cold resisting, with speeds of 1 sec. to 1/500th. The shutter release is conveniently placed on the top of the camera body and is so gentle in action that long instantaneous exposures can be made with the camera in the hand. The film and shutter winders are incorporated in one control

and this not only increases the speed of operation but prevents double exposures. There are 3 standard lenses of 2 inches focal length, with apertures of f.3.5, f.2.5 and f.2, and 6 Leitz interchangeable long-focus or wide-angle lenses to secure either a larger image of distant objects or a wider angle of view. Other lens manufacturers have also designed objectives for the "Leica." The Zeiss Biotar is available with the amazing aperture of f.1.4. Messrs. Dallmeyer, Ltd., the well-known English opticians, have designed a remarkable tele-lens of 12 inches focal length, giving 6 linear magnifications or 36 times increase of area. With such a lens, wild animal and bird pictures are comparatively easy to secure.

In addition, there are many supplementary equipments designed for the "Leica," which enable this little camera to be used for every type of work, from copying to infra-red photography. Prices vary according to the model and lens from Rs. 250 to Rs. 500.

Much that has been said about the "Leica" applies also to the *Zeiss Ikon "Contax"* (Adair, Dutt & Co.) Both cameras are similar in design and operation. The "Contax," however, is slightly larger and weighs slightly more. It is still pocketable, however. This camera is also fitted with a coupled range-finder and a wide range of interchangeable lenses with apertures from f.1.5, and focal lengths up to 18, 30 and 50 cms. The latter lens is a Tele-Tessar, aperture f.8, and gives no less than 100 times increase in area. What a lens for the specialist!

The all metal focal-plane shutter of the "Contax" gives speeds from $\frac{1}{2}$ sec. to $1/1000$ th. It is reliable in all climates and the makers have so arranged the

shutter speed regulator that the various speeds are arranged in groups. This makes for speedy operation, an important point in rapid action photography, for instance.

As with the "Leica," Zeiss Ikon have designed special equipment for all types of work. There are additional view-finders available, adjustable for the lenses of different focal length. Also filters, special developing and enlarging apparatus, particulars concerning which can be obtained from the Indian Agents. Prices, for the latest model, range from Rs 385 to Rs. 700

In addition to the cameras reviewed above, there are miniature instruments of the reflex type. These are very popular with amateurs as they enable focussing and distance-judging to be dispensed with. They are also an aid to successful pictorial composition and from this point of view are ideal. They are also very suitable for portraiture and even professional photographers are beginning to use them for certain work.

The usual design of these cameras is in box form with twin lenses and diaphragm shutter. The top lens projects the scene on to a hooded ground glass screen, on which it is viewed by the operator. The other lens is the taking lens, and the two are so perfectly paired that what is seen on the screen always appears in the picture.

Typical reflex miniature models are :—

Franke and Heidecke "Rollerflex" and "Rollercord."
Messrs. Agfa Photo. Co.

Both these cameras are similar in design, perfect workmanship and ease of operation. Magnifiers are

fitted in the focussing hoods and this enables such sharp focus to be obtained that enlargements of extraordinary dimensions can be made. The taking lenses are Zeiss Tessars of f.4.5, f.3.8 f.3.5 or f.2.8 apertures. Prices: approximately Rs. 160 to Rs. 280. Many accessories are available.

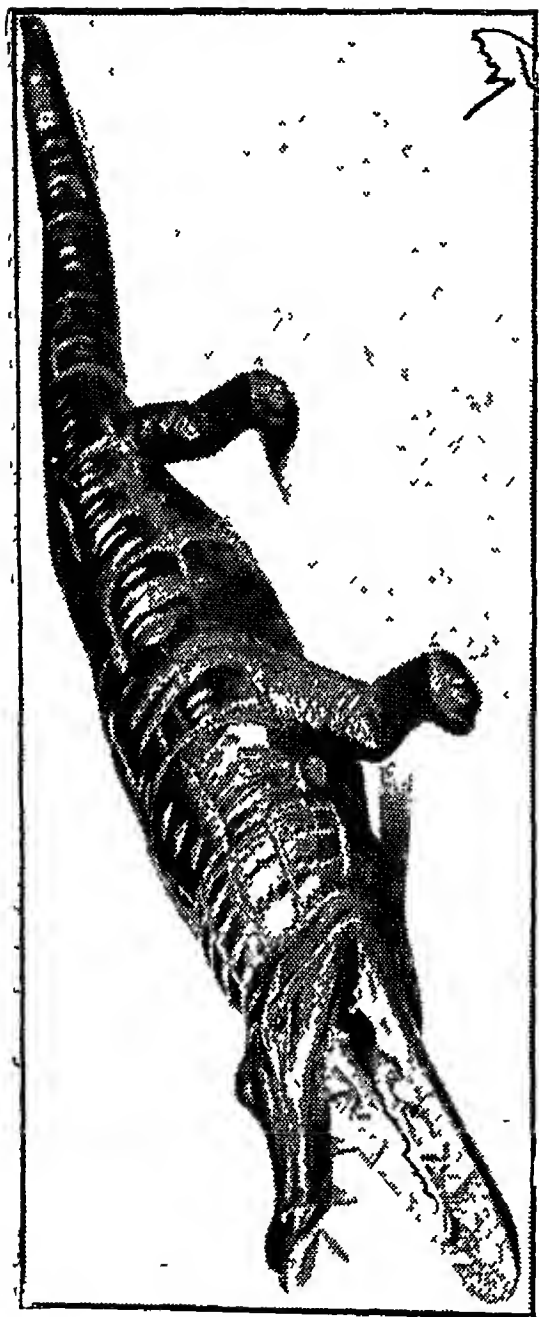
Voigtlander "Brilliant" and "Superb" Schering-Kahlbaum (India), Ltd.

The first camera offers wonderful value for money. Fully efficient, and remarkably simple to operate, it sells in India for Rs. 29 to Rs. 95 according to lens. Like the "Rolleiflex", this camera takes pictures $2\frac{1}{4}$ by $2\frac{1}{4}$ ins., 12 instead of 8 on a $3\frac{1}{4}$ by $2\frac{1}{4}$ roll film. "Three point focussing" is employed and this enables the beginner to avoid the usual trouble in this respect.

The "Superb" is a more expensive model. The usual Voigtlander standard of workmanship is fully maintained and good results are assured. Price, with f 3.5 lens, Rs. 230.

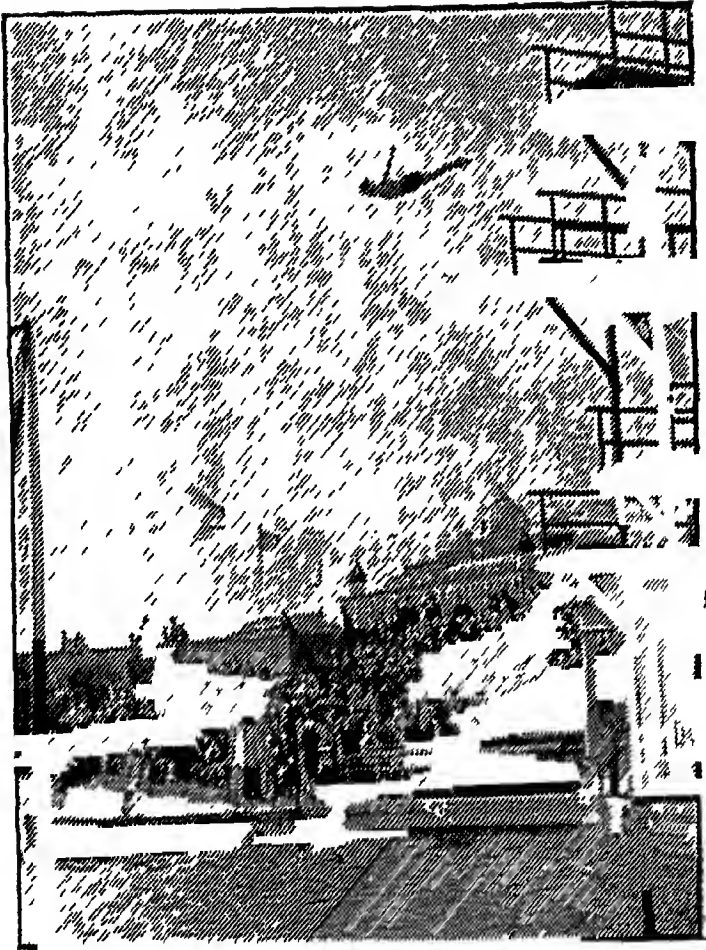
The "*Foth-Flex*" is another camera that takes $2\frac{1}{4}$ inch square pictures. Messrs. Mangalbhoj are the Indian Agents. F.3.5 anastigmat lens, and focal-plane, not diaphragm, shutter giving speeds from 1/25th to 1/500th sec. Price: approximately Rs. 150.

Zeiss Ikon have recently brought out a camera of this type, the "*Ikonflex*" The f.4.5 "Novar" lens model is available through Adair, Dutt's in India at the very reasonable price of Rs. 85. This instrument should appeal to those amateurs who have always coveted a twin-lens reflex but have been unable to afford the



Compare with the preceding illustration This photo was taken with a Dallmeyer Telephoto lens, and shows normal proportions

(Photo, by J H Ahearn, reproduced by courtesy of J H Dallmeyer, Ltd.)



"HIGH DIVE" A Leica "snapshot" miniature cameras, with their ultra-rapid lenses, are fine little instruments for high speed work
(Reproduced by courtesy of Messrs E. Leitz)

price of the "Rolleicord" or "Superb." The "Ikoflex" would be very suitable for competition "snaps"

Then there is the "*Welta-Perfecta*." (Indian Agents: Wellington & Ward, Bombay and Calcutta.) This camera also takes $2\frac{1}{4}$ by $2\frac{1}{4}$ inch pictures, is a twin-lens reflex but differs from other cameras of this type by reason of the fact that it is a folding instrument. This would be an advantage if the greatest degree of portability were required. F.3.8 Zeiss Tessar lens in Compur shutter. Price: Rs. 230

And lastly there is the *Ihagee* "*Exakta*." This remarkable little instrument takes V. P. pictures and, although it only possesses the one taking lens, is also provided with the reflex arrangement. It is designed on the same principles as normal-sized reflex cameras. Built in traingular form, and beautifully finished, this camera has won great popularity in England. Focal-plane shutter with speeds from 12 secs to 1/1000th in the latest "Multi-Speed" model. Fitted with quality lenses up to f.2.8 aperture. A Dallmeyer "Super-Six" lens of f.1.9 aperture is also made for this camera and will appeal strongly to the night photographer. It is not listed by the makers of the camera but can be obtained through Messrs. Baird and Tatlock. An ultra-rapid Zeiss Biotar lens is also available for the "*Exakta*." Several view-finders are combined in the hood of the camera. Six-inch Dallmeyer Dallon, and Hugo Meyer "Tele-Megor", are also made for this camera and interchange with the normal lens for long distance work. Prices: Rs. 170 to Rs. 450 according to model and lens. Accessories available.

BUYING SECOND-HAND CAMERAS.

It is possible to pick up many good bargains in the second-hand market provided the amateur photographer knows how to go about it. The Indian market is too small to offer many opportunities, and one has to exercise a good deal of care when replying to camera advertisements in the newspapers. On the whole, I would advise the Indian amateur to play for safety and avoid buying from Indian advertisers under normal circumstances. Cameras deteriorate quickly in this country and, unless one can have the opportunity to test the camera and has sufficient knowledge of camera construction to be able to do so, it is asking for trouble to buy second-hand out here.

The best thing to do is to get in touch with reputable London dealers who specialise in used instruments. Pages of second-hand offers appear every week in the "Amateur Photographer", and other papers of the same type. These firms have their reputations to maintain and will never intentionally sell a camera that is not fully up to specification and in good working order. Several of them cater with particular care for the Overseas photographer and amateurs in India can safely write their requirements in the certainty that they will be given a square deal. Perfectly reliable London firms specialising in used cameras, lenses and other apparatus include the following :—

Messrs. Wallace Heaton, Ltd., 119, New Bond St., London, W.I. Carry a large stock of used cameras and will always meet Overseas photographers' requirements.

Messrs. City, Sale & Exchange (1929), Ltd., 60, Cheapside, London, E.C. 2. One of the biggest

photographic firms in England. I have had most successful transactions with them and can vouch for their efficiency and integrity.

Messrs Dollond & Aitchison, 35, Ludgate Hill, London, E C. 4. Another big and reliable firm that advertise regularly in the photographic press. Carry large stocks

Messrs. Westminster Photographic Exchange, Ltd., 111, Oxford St., London, W.1. Sell second-hand instruments and are entirely reliable Another very big firm.

Although dealers such as these will always see that their second-hand instruments are in good order before dispatch, they naturally cannot be in any way responsible for the wearing qualities of their second-hand goods. It pays therefore to buy a camera of well-known and reliable make. The extra cost will be saved in the better wearing qualities of the camera. Also be prepared to pay a good price for your second-hand goods To expect to get a perfect instrument at a "cat's meat" price is fair neither to the dealers nor to yourself. Prices in the second-hand camera market are very carefully regulated. For good-class apparatus in good condition they stand at present at about half the price paid when new, with exceptions in the case of high-class miniature instruments which stand higher owing to their great popularity at present.

If you write to any of these dealers from India the wisest thing to do is to state exactly but briefly the type or make of camera you want, and leave the rest to them. These firms usually prefer full cash with order but will often dispatch the goods C.O.D. if a 83 per cent deposit is sent

Whatever camera you buy, whether new or second-hand, you will be wise to take the greatest care in the way you keep it. Even the cheapest camera is worth something in the second-hand market provided it is in reasonably good condition. But, if it has been neglected and allowed to be deteriorated by weather conditions, it will fetch practically nothing. The majority of amateurs are much influenced in their choice of a camera by its appearance. Not only will you run the risk of a sudden breakdown if you neglect your camera but you will also be losing money.

Conditions in many parts of India are about as bad for cameras as one can find anywhere. Particular care is required, therefore, if the instrument is to be kept in good condition. Try to store it in a reasonably dry and cool place when not in use. If this is impossible one of the drying tins sold for the storage of tobacco, cigars, etc., will provide a safe receptacle against damp. Always replace in the leather case after use. To leave the camera lying about in the sun is to ask for trouble. In fact, the wise amateur out here does not expose his instrument to the heat of the sun more than is absolutely necessary even when taking pictures.

It is wise to dust the camera carefully every now and then but don't start attempting to get at inaccessible places or damage will probably result. Lenses should always be capped when not in use. This prevents dust settling on the highly polished surfaces. Occasionally the surfaces of the lens should be carefully dusted and polished but great care is necessary to avoid scratching the glass. A soft linen handkerchief is the best "duster" to use. A very useful lens-cleaning outfit is marketed by Messrs. Dallmeyer, Ltd., about which

Baird & Tatlock's will doubtless give particulars. It would cost approximately Rs. 3 in India and is a useful little accessory for preventing definition being impaired by dust on the lens.

With reasonable common-sense precautions it is possible to keep a camera in good condition for many years in India. But, as in every other department of amateur photography, the greatest care is required if success is to be attained.

CHAPTER III.

MAKING THE EXPOSURE.

In order to understand, and be able to master, many of the problems that arise when we come to make the exposure, it is necessary to explain briefly what a camera does. We all know that the lens is the most important (and the most expensive) part of a camera. What precisely does the lens do ?

It is not at all difficult. When we see an object, light rays travel in straight lines from the various parts of that object to the eye. The lens in the front of the eye condenses these light rays and a minute reversed image of the object is projected upon the sensitive tissue at the back of the eye.

A camera works in exactly similar fashion. The camera lens projects the image upon the sensitive surface of the plate or film. Its function is to catch all the rays of light and bring them together so that a much diminished representation of the scene before the camera is produced on the plate.

When we take a scene containing much detail some of that detail, when reproduced on the plate or film, will be so microscopic that it will be hardly visible to the unaided eye. This will apply particularly to miniature cameras with their tiny negatives. We can readily realise what tremendous demands are placed upon the modern photographic lens.

The art of lens construction, however, has reached such perfection that the modern photographer can tackle even the most difficult subject with perfect confidence. Photographic lenses consist of several glasses (sometimes as many as six, or even seven), designed and constructed to work together to form a perfect whole. Each lens has to undergo the most rigorous tests before it is placed on the market. For one famous make, no less than 106 tests are required before an individual lens is allowed to leave the factory.

The results of this minute care in manufacture are seen in the performance of modern photographic lenses. Even cheap cameras today are fitted with an entirely satisfactory optical system, giving needle-sharp definition. Unfortunately, too many amateur photographers in India and elsewhere never get the best out of their lenses

Box, and the cheaper types of folding, cameras are fitted with simple doublet or rapid rectilinear lenses, which are quite satisfactory for elementary work. They are necessarily slow and will not therefore prove efficient optical instruments for the more advanced amateur. He needs an "anastigmat" lens, various types of which are now fitted to all the more expensive cameras, as noted in the previous chapter. These lenses are called "anastigmats" because they give sharp definition to the margins of the plate even when used at full aperture. They have, in fact, been specially corrected for astigmatism, which fault is always found with the simpler types of lenses and can only be eradicated by the use of a small stop. For rapid rectilinear lenses, for

instance, f.8 is about the maximum aperture that can be used, while f.11 is usually necessary for simple doublets

What exactly does f.8, or f.11, mean? We all know that when a magnifying glass is held at a certain distance from a piece of paper a bright image of the sun will appear and a hole will be charred in the paper. The distance of the magnifier from the paper is the focal length of this particular lens.

Similarly, photographic lenses must be placed at a certain distance from the plate or film to give sharp definition. This distance is called the "focal length" and is always marked in inches or centimetres on the front. Now the diameter of the lens in relation to its focal length determines the amount of light that will be passed. A lens of 2 inches diameter and 6 inches focal length will pass twice as much light as a lens of the same focal length but only 1 inch in diameter. It will therefore be twice as "fast." This measurement of the speed of the lens is calculated in f. numbers. The focal length divided by the diameter of the lens gives the f. number. For the 2 inch diameter lens it will be 6. It is by comparison of these f. numbers that we are able to gauge exposure times with accuracy, as we shall see later in this chapter

On older types of cameras U.S. numbers are sometimes used to mark the stops, which are fitted (usually as an arrangement of thin metal leaves, called an "iris") to all lenses and which enable the photographer to use a small or a large aperture as occasion demands. It is therefore well to remember that U.S.1 equals f.4; U.S.2, f.5.6; U.S.4, f.8; U.S.8, f.11; U.S.16, f.16; and

U.S.32, f.22. We shall have something to say later on about the correct use of lens stops.

To refer again to the "focal length", which, as we have seen, is the distance at which any particular lens must be placed from the plate to yield sharp definition. A lens of 6 inches focal length used on a V.P. camera will give twice as large an image of an object as a lens of 3 inches focal length. It will, however, include much less of the scene before the camera. The scale of reproduction and angle of view therefore depend upon the focal length of the lens in relation to the size of the plate or film.

For general amateur work a lens of focal length approximating to the diameter of the picture size is the most satisfactory and such lenses are almost invariably fitted to hand, miniature and reflex cameras. For special work, lenses of greater or less focal length can be fitted interchangeably to certain of the more costly types of instrument, as noted in Chapter II. Whatever focal length of anastigmat lens is used, however, adjustment is required for objects that are less than a certain calculated distance from the camera, called "infinity." This is because the image of a near object comes to focus at a greater distance behind the lens. To compensate for this difference the extension between the lens and the plate must be increased in accordance with the scale fitted to the instrument. This adjustment is called "focussing."

There is no doubt that careless sighting and focussing are responsible for nearly as many amateur photographic failures as incorrect exposure calculation. We will now deal with the practical aspects of camera

manipulation from these three points of view. Even with the cheapest of modern cameras, it only requires a little study and a little care to obviate these three fruitful sources of error. Attention to the various points that follow will enable the beginner to secure a high percentage of successful pictures.

The type of view-finder usually fitted to box and folding cameras is known as the "brilliant" finder. It consists of two lenses, with a mirror between them, fitted in a miniature metal box, and it gives a very bright representation of the scene before the camera. When using this type of finder it must be remembered that (1) the scene is reversed from left to right, (2) the finder gives a far brighter representation of the subject than will appear on the film, (3) correct sighting can only be obtained by looking from directly above the finder, and by holding the camera level, and (4) it is necessary, when sighting near objects, to allow for the difference in viewing angle of the finder and the lens (called "parallax") by moving the camera, so that the lens is in the position previously occupied by the finder, before exposing.

"Direct-vision" finders, the standard equipment on folding focal plane cameras, are now fitted to many amateur instruments. They enable the camera to be sighted from eye-level for speed subjects, a class of work for which the "brilliant" finder is unsuitable.

These finders are either in the form of a rectangular double concave lens, giving a reduced image of the scene before the camera when centred by a sighting pin, or of the wire frame type. The former can be obtained with a blue glass which reduces the subject to

monochrome and is a valuable aid to successful pictorial work. The latter, which consists of a front wire frame centred by means of a smaller wire frame at the back of the camera, is much in favour with press photographers and possesses the additional advantage that, when telephoto lenses are used, a mask can be slipped over the front frame to give a reduced field of view.

It sometimes occurs, especially with old-fashioned instruments, that the view-finder does not show the same field of view as the lens. This means that, sooner or later, a valuable picture will be spoiled. Fortunately, the finder can easily be tested.

Place the camera in such a position that a window is just included in the finder. Place a focussing screen (a piece of ground glass, ordinary glass coated with flour and water paste, or even a white handkerchief tightly stretched) in the position normally occupied by the film. Then, with an open lens, an image of the window will be seen on the screen and it will immediately be observed whether it exactly fills the picture space or whether careful allowance must be made for any difference that exists.

Still more important than sighting is focussing. How often do we see amateur snapshots spoiled owing to blurring of the principal object? On box cameras, with slow meniscus lenses no focussing is necessary. With anastigmats, distances must be carefully judged if full advantage is to be taken of the critical defining power of the lens.

Focussing devices nowadays are either in the form of a variable extension of the camera front, usually worked by a radial pointer in conjunction with a distance scale,

or by a helical movement of the lens mount. In both cases, it is necessary to judge the distance to the principal object in the picture. and to set either the pointer or the lens to that distance before exposing.

The infinity distance of the lens depends to some extent on the size of the camera. With a $\frac{1}{4}$ -plate instrument all objects beyond about 30 yards will be in sharp focus when the lens is set to infinity; with a V.P. camera from 2 to 12 yards will be about the distance that one has to judge.

A few fortunate photographers are born with the knack of judging distances. Most of us have to acquire it by constant practise. It is a good plan to make a habit of judging distances whenever one gets the chance. When out for a walk, for instance, one can stop at a certain distance from an object, judge it as carefully as possible and then pace it out in yards to verify one's estimate. In this way the mind gradually accustoms itself to accurate judgment.

Nowadays, however, automatic range-finders are being supplied for photographic distance judging. In many of the latest cameras, as explained in Chapter II., a range-finder is coupled to the spiral movement of the lens so that automatic focussing is attained. The photographer only has to manipulate the lens movement until the double image seen in the range-finder merges into a single image when he can be certain of the sharpest focus.

This is a tremendous advantage with miniature instruments, which demand needle-sharp definition if successful enlargements are to be made. But these automatic focussing cameras are expensive, too expensive for the majority of amateur photographers.

Certainly very accurate range-finders can be bought for attachment to any camera. They are not expensive. A well-known, and most beautifully made, range-finder is the Leitz, which is marketed in India by Messrs. Baird & Tatlock, at about Rs 25. In certain cases such an instrument is a very useful accessory and enables great accuracy in focussing to be attained. Unfortunately, a certain amount of delay must arise while the photographer is calculating the distance with the range-finder and then setting the lens to the reading it gives. For the majority of us, the ability to judge distances accurately is still invaluable.

Depth of focus is another subject that is of the greatest importance. Generally speaking, the greater the focal length, and the greater the aperture of a lens, the more shallow its depth of focus at short distances from the camera. This means that, whereas a lens working at an aperture of $f.29$ on a $\frac{1}{4}$ -plate camera will have to be very accurately focussed to give a sharp image of the principal object, a similar aperture lens on a V.P. camera will possess far greater latitude. Or, again, the $\frac{1}{4}$ -plate picture will show far greater blurring of the background than the V.P. snap.

Here we have the explanation of the increasing popularity of miniature instruments. On a small negative camera a lens of short focal length and of extreme rapidity can be fitted without the disadvantage of shallow depth of focus. Thus it is possible to take action pictures in very poor light that would not be possible with a larger instrument without such blurring of the background as to rob the photograph of much of its value.

For, despite what the older generation of pictorialists may say, there will be few modern photographers who can discover virtues in blurred backgrounds. Even many of the photographs published in the newspapers today are rendered far less effectively than one would wish by reason of this depth of focus trouble

Yet, in portraiture, shallow depth of focus is of great advantage. By this means a neutral background is obtained. In this case, all the interest should be directed to the principal object, the face or figure of the model, and no distractions in the background are required.

Therefore, as a useful guide, we can sum up the matter as follows. For portraiture, use a large aperture, and a rapid shutter speed. For general work, the smallest aperture and the slowest speed that the light and the subject will permit.

Decrease of the lens aperture increases the depth of focus. Accurate tables of the depth of focus at various distances and apertures are included in such books as Burroughs Welcome's Photographic Handbook and Diary and should be studied by every keen amateur. Many miniature cameras have a depth of focus scale engraved on the lens mount, or attached to the body of the camera, and this is very useful in deciding upon the most suitable stop and distance for any particular picture

In the foregoing we have purposely not referred to the great advantages of reflex cameras, miniature and otherwise, in the matter of sighting and focussing. With these cameras we can see on the ground-glass

focussing screen the pictures, as regards size and sharpness of focus, exactly as it will appear in the finished print. There is no calculation of distances or depth of focus; no compensation for parallax. Moreover, the focussing can be manipulated right up to the moment of exposing.

For natural animal and child studies, and all general work, with the exception of rapid action photography, the reflex is, therefore, the easiest instrument with which to obtain first-class results.

Now we come to exposure problems. The shutter of the camera enables us to make the exposure. Shutters are only of secondary importance to the lens itself. Without a reliable shutter, that gives the speeds required by any particular subject, the perfect qualities of the finest lenses in the world cannot be fully utilised.

There are two distinct types of shutters fitted to modern cameras. The first, which is usually fitted to amateur instruments, is of the diaphragm type. It works between the component glasses of the lens and is regulated by clock-work to give a range of exposure speeds. The actual exposure is made by the opening and closing of two or three metal leaves. The best shutters of this type, such as the Compur (which is fitted nowadays to all the more expensive amateur cameras), are as satisfactory as any shutter on the market. They are perfectly made and will give years of service even under tropical conditions. Even the less expensive examples of the diaphragm shutter can be implicitly relied on for Indian conditions. As in the case of lenses, perfection has been reached in the construction of camera shutters and the modern photographer has every facility for successful operating.

The Compur shutter has a wide range of speeds from 1 sec. to 1/200th. 1/300th or 1/500th, according to the size. These high speeds will be sufficient for the needs of most amateurs and it is only when we come to real high speed work that higher speeds are required. The cheaper types have a more restricted range of speeds, usually up to 1/100th sec. only, but even this is sufficient for the needs of the less advanced amateur. There is one very important point with regard to diaphragm shutters. Read the instructions for use of the shutter issued with your camera and adhere to them. If you are told not to change the setting of the speed after the shutter has been wound, then be careful not to do so. These shutters are delicate pieces of mechanism and they cannot be expected to work properly if they are not treated with due respect. If something does go wrong, take the camera to a reliable dealer. To start "repairs" yourself may mean a new shutter and these shutters are not as cheap as all that.

The advanced amateur is often not satisfied with the highest speeds of a diaphragm shutter. He wants to be able to tackle any subject under any conditions. The focal-plane shutter is his ideal. These shutters consist of a roller blind working just in front of the plate or film, and are fitted to the majority of reflex and all press cameras. Speeds up to 1/2000th sec. can be attained in this way. Racing cars, moving at 100 miles an hour can be "snapped" a few yards away with such speeds as this. The most costly miniature cameras, such as the "Contax", "Exacta" and "Leica", are almost all fitted with focal-plane shutters. The only trouble with these shutters is that many of them do not

stand up to tropical conditions as well of those of the diaphragm type. This, however, does not apply to the all-metal focal-plane shutters fitted to all Zeiss Ikon cameras, including "Contax." It also does not apply to the "Leica", which has a special rubber cloth shutter guaranteed to withstand any extremes of heat and cold. Other cameras are similarly guaranteed, and, in buying a camera with a shutter of this type, the Indian amateur should pay particular attention to the wearing qualities of the blind. Actually, it is quite a simple and inexpensive matter to have a new blind fitted, but this is not such an easy matter in India as in England, for example.

How are we going to use our very efficient shutters? To what speeds must they be set for different subjects and different lighting conditions? What are the factors that influence exposure—the foundation upon which success in any branch of photography is built? Experience is the surest guide to success and this is particularly the case in India where lighting difficulties are often more perplexing than in temperate climates. On such a complex question it is impossible to lay down hard and fast rules. We can do no more than explain the general principles and thus assist the amateur in this country to acquire the necessary experience in the shortest possible time.

Photographic exposure is influenced by the following factors; (1) Light, (2) Subject, (3) Lens Aperture and (4) Speed of Plate or Film.

(1) *Light*.—The difference that exists between the optical and chemical strength of light is not generally appreciated. This difference is of the greatest impor-

tance in photography for, while it is the optical strength of the light that is registered by the eye and the viewfinder, it is the chemical strength that affects the film.

The chemical activity of light depends mainly upon the blue and violet rays, which are more sensitive to atmospheric conditions than the other components of white light. It is found, for instance, that the chemical strength of light reaches its greatest intensity shortly before midday. As the water vapour content of the air increases in the afternoon, the chemical strength of the light declines, though the eye can register no difference whatever.

Although the latitude of modern plates and films will usually suffice to compensate for this difference, there are certain subjects and conditions that demand careful attention. Out here, for instance, an appreciably longer exposure is required during the monsoon months, when the air is laden with water vapour, than is the case during the hot weather. Towards sunset, although the optical strength of the light may still appear to be good, its chemical strength has been greatly decreased.

At this time of the day it is desirable to use panchromatic plates or films, which are much more sensitive to the yellow rays than ordinary negative material. Towards sunset, or just after sunrise, the light is composed of far more yellow rays than usual. Pan. plates will register this light so successfully that only a very small increase in exposure will be required.

Clouds affect the intensity of the light to a considerable degree. If they are in the form of large, white masses, then they act as powerful reflectors and increase the light's strength. If, as is often the case in

India, there is haze in the atmosphere, such as "heat mist", the chemical power of the light is greatly decreased. Under these circumstances, especially for distant landscape work, panchromatic material and a suitable filter sometimes become an absolute necessity.

Subject to the considerations noted above, we can tabulate Indian exposures as follows :—

| | |
|-----------------------|-------------------------------------|
| Between 8 a m & 4 p m | Normal exposure |
| At 7 a m & 5-30 p m | Double normal exposure |
| At 6-30 a m & 6 p m | Four times normal exposure |
| At sunset or sunrise | Six to twelve times normal exposure |

When the light is cloudy bright, 3 times normal exposure is advisable ; when full dull, 6 times. "Heat mist" in landscape work necessitates quite twice normal exposure even with a panchromatic plate, during monsoon months, it is advisable to give slightly longer exposure (say an increase of half) than in dry weather.

(2) *Subjects*.—The nature of the subject and its distance from the camera affects times of exposure. In Indian scenes we get very dense blacks and very bright whites. Many beginners think that to avoid over-emphasis of the contrast between light and shade a short exposure should be given. Actually, full exposure is essential in order to get detail in the shadows and so avoid "soot and whitewash" pictures.

"Expose for the shadows" is a slogan that can never be disregarded by photographers in India. If there are no shadows, then to avoid flatness over-exposure must not be given. We shall deal more fully with the relative exposures advisable for different classes of work in later articles.

It can be accepted as a general rule that subjects at a distance of less than 24 feet from the camera require

double exposure; under 12 feet, 3 times. This is of particular importance in portraiture. Under-exposure ruins many amateur portraits.

Other special subjects and approximate exposure times for India are :—Clouds, 1/8th normal exposure : sea and sky, 1/8th: sea with ships, 1/4. white architecture, 1/2.

(3) *Lens Aperture*.—As every photographer knows, a longer exposure is required with a small than with a large diaphragm opening. The relative exposures required are in accordance with the f. numbers marked on the lens, To find the increase in exposure required between two stops, square their f. numbers and compare. For instance, the exposure at f. 8 is half that required at f. 11. ($8^2=64$. $11^2=121$. 64:121: :1 2.)

(4) *Speed of plate or Film*.—Even with the comparative system of emulsion speeds now adopted by manufacturers (H. & D. numbers), the wise amateur does not change his plates or films more often than absolutely necessary. When changing, it can be remembered that the influence of H and D. speeds on exposure times is roughly as follows. This does not apply, however, to all grades of plates and films, and types of subject, and the wise amateur will not rest content until he has made his own test exposures :—

| | | | |
|-------|-------|-----------------------|-------------------------------|
| 2,700 | H & D | (26 degrees Scheiner) | Normal exposure |
| 1,300 | " | (23 " |) Twice normal exposure |
| 700 | " | (20 " |) Three times normal exposure |
| 300 | " | (17 " |) Four times normal exposure |

Recently *din.* values have been introduced by German manufacturers. 16/10 deg. *din.* equals 2,700 H. & D., 13-10 deg. *din.* requires twice this exposure, 10-10 deg.

din requires four times, and so on for each decrease of $3/10$ deg. *din*.

These, then, are the more important theoretical considerations that the photographer has to bear in mind when calculating exposures. How can he put them into practice?

Experience, based on a study of carefully kept records of a large number of exposures, coupled with the use of a reliable exposure meter will solve most exposure problems.

There are three types of exposure meters on the market. The first involves the exposure of sensitised paper to the light and the calculation of the correct exposure from the time taken for the paper to darken to a standard tint. A good meter of this type is the "Wynne Hunter", costing Rs. 11-8 from Messrs. Kodak, Ltd.

Then there are "extinction" meters, through which the subject is viewed and the light gradually diminished until extinct. Scales then show the required exposure at any diaphragm stop and for the various plate speeds. Messrs. Zeiss Ikon manufacture a reliable meter of this type, the "Diaphot", obtainable from Messrs. Adair, Dutt at Rs. 5-12. Then there are the well-known series of "Drem" meters, special model of which are available for "Leica" and "Contax" cameras. There is also the "Justophot", sold in India by Messrs. Kodak at Rs. 25, and many other instruments of the same type manufactured by other firms.

A certain amount of care is required when using these extinction meters. The condition of the eye affects the reading. For instance, an eye accustomed to glaring sunshine would see a different reading to another that had been rested in a dark room. Experi-

ence, however, will soon teach the photographer the correct allowances to make under various circumstances.

Lately, several photo-electric meters have been placed on the market. The strength of the light is registered automatically by an electric current generated by a photo-electric cell and is measured by a needle working over a scale. Two of the best-known meters of the photo-electric type are the "Weston" series (full particulars of which can be obtained from the Indian Agents, Messrs. Eastern Electric and Engineering Co., Bombay) and the Dallmeyer "Ombrux" (Messrs. Baird & Tatlock.) Both these meters are absolutely reliable and give such accurate measurement of the light that many exposure problems can be immediately overcome.

Nevertheless, for the really keen amateur, we still maintain that, whatever exposure meter is used, the human element can never be dispensed with. The wise amateur uses a meter or a calculator, such as that included in the Burroughs Welcome handbook in conjunction with the fruits of his own experience. Thus does he avoid the exposure pitfalls that ruin so many beginners' pictures.

Filters are much used in portrait and landscape work. They are intended to compensate for the difference that exists between the eye and the film in registering colour values. The purpose of photography is to represent a scene as it would appear to the eye. Filters are of great assistance in attaining this ideal.

Filters are also of the greatest value in cutting out some of the very active ultra-violet rays and so preventing over-exposure. Especially with miniature

cameras, it is essential to give the minimum correct exposure if good enlargements are to be obtained. This cannot be stressed too strongly.

Over-exposure coarsens the image to a disastrous degree and miniature negatives thus degraded will not stand a high degree of enlargement. For this reason many miniature photographers always use a light filter on the lens for outdoor work (a sound plan, by the way, for *all* camera users in India). This, of course, necessitates an increase in exposure according to the colour and density of the filter; exposure factors of filters are always given by the makers and it is only necessary to follow their instructions to obtain perfect results.

For general work in India, a $K1\frac{1}{2}$ filter is most useful. This necessitates double exposure with panchromatic plates or films, and an increase of four times when orthochromatic material is used. A red filter, such as the Agfa "Rubin", is indispensable for long-distance work in this country. Used with panchromatic plates, it will enable haze to be penetrated and wonderful detail secured.

Filters are not expensive and every amateur in India should certainly possess one. Do not buy cheap filters made by little-known makers. A good quality filter is required if the definition of the lens is to remain unimpaired.

As regards the best films and plates for Indian use, little need be said. Manufacturers have reached such a high standard of excellence in negative material that any of the well-known makes can be implicitly relied on. Any of the 'chrome films, like "Verichrome,"

"Selochrome" and "Isochrome" are very satisfactory for amateur work. "Isochrome", by the way, develops quickly. Zeiss Ikon "Pernox" is a fine film for rapid action work. Perutz "Persenso" is also particularly suitable when short exposures are essential even in comparatively poor light. Of the panchromatic films, Kodak "Super Sensitive", Agfa "Super-Pan" and "Selo Panchromatic", (marketed by Messrs. Wellington & Ward, Bombay and Calcutta), are perhaps the best-known and are all very fine films, specially suitable for night work

For miniature cameras, using ciné film in 12 or 36 exposure spools, a very wide range of negative material is now available. Perutz (Indian Agents: Messrs Ali Bros, Nagdevi St., Bombay) market several films, specially spooled for ciné film cameras like the "Leica." The fine-grain film is particularly valuable for use when big enlargements have to be made from the tiny negatives. Other firms also market special fine-grain films, which in conjunction with a special developer, will enable enormous enlargements to be made without revealing the grain of the film. In this connection, Messrs Kodak are to be congratulated on their "Panatomic" film, which is available for all small-size cameras. Except for speed subjects, the wise miniature photographer will always use a fine-grain film. At present, these films are slower than many others with normal grain: this is unavoidable for technical reasons. But it is likely that we shall see great developments in this direction in the near future.

There are so many splendid plates available in India that it is difficult to choose the most suitable. I have tried many grades and makes, and there is little to

choose between any of them for the particular work for which they are recommended by the makers. The new Kodak "Polychrome" plate, specially hardened to resist high temperatures, will appeal to many workers. Wellington "Anti-Screen", Ilford "Iso-Zenith" and "Auto-Filter", several of the Barnet grades, including their very high speed "Super-Press", which is particularly suitable for those amateurs who aspire to press contribution, and Agfa "Extra Rapid" are all favourites of mine and have served me well on many occasions.

Panchromatic plates are advisable for much indoor and outdoor work in India. The soft-gradation varieties, of which well-known examples are Ilford S. G. Pan, Barnet "Soft-Pan" and Wellington "Soft-Spectrum" give a beautifully graded negative and are specially suitable for landscape work and portraiture. Any possessor of a plate camera who has not yet tried these fine plates would be well-advised to do so at the earliest opportunity.

For night pictures, when a super-speed plate is required to permit instantaneous exposures, Ilford "Hyper Pan" and Agfa "Super-Pan" plates are excellent. The former has the amazing speed of 2,500 H. & D. to daylight and 8,000 H. & D. to half watt lighting. It is said to be even faster than the Supersensitive Pan. film made by the same firm and can safely be rated at 50 per cent faster than the most rapid 'chrome film when used in daylight. It is, thanks to this supersensitive panchromatic material that night snapshotting is no longer confined to the amateur with a super-speed lens.

CHAPTER IV.

TROPICAL DEVELOPING, PRINTING AND ENLARGING.

What happens when an exposed plate or film is developed? We know what it looks like before—a saffron coloured coating of emulsion on celluloid or glass—and after—a transparent negative with black deposits of varying density imbedded in it. What brings about this change?

It is all quite simple. A photographic film is made by coating a strip of celluloid with a mixture of gelatine and certain silver salts. The gelatine is merely used to spread the minute grains of the salts of silver evenly over the surface and to hold them in suspension there. Gelatine is what is called a colloid and allows the various solutions used during photographic development to diffuse through it, and react upon the silver salts.

These silver salts are sensitive to light, and, after exposure to it, can be converted into microscopic grains of metallic silver. This is precisely what we do during development. Our developing solution converts the grains of silver that have been exposed to light into black metallic silver.

Now, when the exposure was made, certain parts of the film emulsion were exposed to stronger light than others. In these parts more of the sensitive salts will be converted into metallic silver. In these parts,

therefore, we get a denser deposit. While in the shadows of the scene before the camera, from which the light was reflected weakly, we shall find very light deposits, or, if the exposure has been insufficient, practically no deposit at all. In these parts the action of light upon the silver salts has been insufficient to permit the developer to convert them into metallic silver.

We now realise why correct exposure is essential if the correct tone values of the subject are to be reproduced. Over-exposure allows too many of the grains of silver salt to be converted into metallic silver, under-exposure allows too few. When we come to print our negative, we find that in both cases the correct gradations of light and shade have been lost.

Now, simple as this process sounds, there are one or two important points arising from it. To secure the best results the silver salts have to be treated with consideration. We have got to ensure that their formation takes place under the most favourable circumstances. The developer has to be of suitable strength and must be allowed to act upon the silver salts for the correct time.

For these silver salts resent ill-treatment. If we under-expose a negative, and then attempt to atone for this error by developing for twice the normal time we shall find that the silver grains are coarsened. The same result will occur if we dry the film by exposure to great heat. In both cases quality has suffered and this will show when we come to enlarge.

To sum up, correct time of development and suitable strength of developer are essential to secure quality in

the finished print. We shall explain later how these two essential conditions can always be complied with in a simple and reliable manner.

It is not only the silver grains that we have to study. The gelatine in which the silver is imbedded will not permit liberties to be taken with it. Quick changes of temperature during development, or great heat during drying, will cause the gelatine to become distorted and to thicken. This thickening is called "reticulation" and is often encountered by Indian amateurs. It is a serious blemish and will impair the print. It is almost always caused by not having the developing, fixing and other solutions at the same temperature. High climatic temperature of the solutions alone should not impair the negative. It is these changes of temperature that are fatal. We shall have more to say later on this vital subject.

The higher the temperature, the quicker will the plate or film develop. The greater the speed rating of the plate, the longer will it require in the developing bath. Those are two general rules that are worth noting.

Fixing is theoretically an even more simple process than developing. The action of the fixer is to dissolve out the undeveloped silver salts so as to ensure that light has no further effect upon the negative. Only the grains of metallic silver are left suspended in the gelatine.

It follows that insufficient fixing impairs the keeping qualities of the negatives. If the correct time for fixing is 15 minutes, and we only leave the negative in the fixing bath for 5, this means that only a proportion of the active undeveloped silver salts have been

removed, light will have a gradual effect upon the salts that are left and the negative will suffer.

Washing is the third process required in photographic development. Again we are thinking of the keeping qualities of the negatives. Just as hypo has to be used to remove the surplus silver salts, and so fix the image on the plate, so water must be employed to remove the surplus hypo diffused through the gelatine. Failure to remove the surplus hypo results in staining of the negatives within a short time.

Hardeners almost always have to be used during home development in India. Their action is very simple. They merely harden the gelatine to enable it to resist high temperatures without beginning to melt.

The chemical action that is the basis of the development of negatives is again repeated when we come to print or enlarge. The action of light again enables certain of the silver salts in the printing emulsion to be converted into metallic silver. The gelatine emulsions spread on paper are similar to those used for plates and films, except that they are much less sensitive to light. This is essential to enable papers to be handled with comfort during printing.

These are the theoretical considerations that it is as well to grasp before attempting home developing and printing. You will observe how simple it all is. Yet there are thousands of amateurs in India who believe it to be such a difficult and messy business that they always entrust their processing to commercial firms. While it is not denied that these firms give excellent service, it is a proven fact that amateur photographers lose much in quality and cash by not doing their own finishing.

A commercial firm, receiving a large number of films for developing and printing, cannot possibly give individual attention to each customer. The films must be developed for a standard time in a standard developer and printed as quickly as possible. While standard methods are satisfactory for casual snapshots, the serious amateur's work suffers much by the lack of attention to the requirements of each negative.

As regards cost, it is safe to say that home developing, printing and enlarging works out at not more than half the commercial charges. By doing his own processing, an amateur saves money, produces better work and has the satisfaction of feeling that the finished prints are his own unaided efforts

And now for the working details of my own method of home development in India. It is so simple that even beginners will be amazed at the ease with which perfectly developed negatives can be produced. There are other methods, of course, and many of them will yield as good results. But I doubt if any of them are more simple and reliable (No originality, by the way, is claimed for my method; many amateurs, no doubt, have employed it for just as long as I have.)

I do not use developing tanks, reliable as many of them are. Dish development in the dark-room is the basis of my method. No elaborate equipment is required. A bungalow bathroom after dark, with a red curtain temporarily hung over the window, a small dish, a couple of wash-basins, a pint measure marked also in ounces, 2 film clips, a thermometer and an electric torch, with a circular piece of ruby non-actinic fabric (obtainable from any of the leading Indian firms like Kodak's) placed behind the glass, are all

that are required for the production of perfect work. The initial cost of this equipment is under Rs. 10.

My developer is "Azol", a highly concentrated one-solution developer, made by a well-known English firm and selling at a reasonable price. It can be obtained from many photo. firms in India. Or other similar universal developers, such as "Kodol", "Perinal", "Rytol" or "Rodinal" can be used with equal success. These developers are not only clean in working but they keep extraordinarily well—a most important point for amateur photographers in India.

Directions are enclosed with these developers. It is only necessary to dilute the solution with water as directed and pass the film through it for a stated time. Most useful tables are supplied. Thus the folder enclosed with each bottle of "Azol" tells us the required times at various temperatures and strengths of solution for all the plates and films on the market. For dish development of "Verichrome", for instance we are advised to dilute 1 part of "Azol" with 24 parts of water and, at a temperature of 70 degrees Fahr., pass the film backwards and forwards through the solution for 7 minutes. Could anything be simpler than this?

The times given in the tables will produce a negative of average contrast. In portraiture it is often desirable to have less contrast between the blacks and whites of the picture. To obtain this it is only necessary to decrease development times by a quarter. If stronger contrast is desired, as is sometimes advisable when prints are to be reproduced in newspapers and magazines, increase the time of development by the same amount.

Arrange your red light so that it does not shine directly on the film. Hold the film in clips and move it regularly (in the form of a loop) up and down through the developer. Plates can be placed in the covered developing dish which must be gently rocked during development. They are even easier to manipulate than films.

At temperatures of 75 degrees Fahr. and above (here your thermometer comes in handy) a tropical hardener must be used. Suitable hardeners, such as the Ilford, are obtainable from photo. dealers in India and, if used according to the instructions issued with them, will give good results. Hardening can be done either before development or immediately after. I find that *after* gives the most satisfactory results. I make my own hardening solution, using the following Kodak formula :—

| | | | | | |
|-----------------------|----|----|----|----|---------|
| Water | .. | .. | .. | .. | 32 ozs. |
| Potassium Chrome Alum | | | | .. | 1 oz. |

Immediately after development, the film or plate is rapidly rinsed in water and then placed in a dish of the above solution for 3 minutes. It is then rinsed again and fixing is proceeded with. Up to 85 degrees Fahr. this is sufficient to prevent frilling of the gelatine.

Above that temperature, however, the procedure is a little more tricky. It is now essential to cut down the time of development. By using "Azol" at twice the normal strength a development time of 2 minutes will be sufficient for 'chrome film. To the above hardening solution 4 ozs. of sodium sulphate crystals are added. Otherwise the procedure is the same.

Frilling causes such a lot of trouble to amateur photographers in India that it is worth while dealing with it in detail. Frilling is due to softening of the gelatine at the edges of the plate or film and is due (1) to developing at high temperatures without proper precautions and (2) to unequal temperatures of the various solutions in which the film is immersed. Actually I think that unequal temperatures more often cause frilling than high temperatures alone. It is for this reason that the use of ice to reduce the temperatures of the various solutions is rarely satisfactory. It is very difficult to secure even temperature by this means. A fatal error is to make up the fixing solution just before use. Dissolving the fixing salt lowers the temperature of the solution considerably. Make up the solution well beforehand to allow it to return to normal temperature before use. It is surprising to note that frilling very frequently occurs during the English winter. Inexperienced amateurs develop their films in warm developer (say 65 degrees. Fahr.), rinse them in tap water at 35 degrees and then plunge them into warm hypo. Frilling is bound to occur.

So do be careful to avoid sudden changes of temperature. If you do this, and use my hardener with care, frilling should never occur except under the most unlikely circumstances.

There is no remedy for a badly frilled film. If prompt measures are taken when the frilling starts it can sometimes be arrested. Remove the film from the tray as soon as the first signs of frilling are noticed and hold it under a gentle stream of water from the tap so that the frilled portion gradually replaces itself. Transfer to a dish containing 5 per cent alum solution for

15 minutes. Then rinse carefully and proceed. But prevention is far better than any attempt at cure.

A few general hints on development may be useful. Don't attempt to make up for under-exposure by longer development or the result will be harsh. Over-exposure and short development means flatness in the resulting print. Particularly in our light, correct exposure and normal development is the only key to success. By using the solutions recommended, normal development presents no difficulties. Concentrate, therefore, on correct exposure and the results are certain to be satisfactory.

When developing panchromatic films, a ruby light cannot be used. The safest way is to develop in total darkness. This can easily be done and, after a little practise, the passing of the film through the developer in darkness presents no difficulties. The correct time can be noted by an assistant in the next room.

Fixing and washing are simple matters. I use "Kodak Acid Fixing Salt" which is very satisfactory. Other "Acid Fixing Salts" marketed by manufacturers of repute will do just as well. Make up the solution according to the instructions on the tin, place the film or plates in it after hardening and note the time taken for the milky appearance to disappear. Give as long again in the fixing bath which should be agitated at intervals to ensure regular action of the hypo. Wash thoroughly (half an hour in running water, which must circulate through the bowl and not just run across the top, or six 5-minute baths, with constant swirling of the water) if you want your negatives to be permanent.

Insufficient fixing and washing soon gives rise to trouble. The negatives will fade or turn yellow. It is

very irritating to want some more prints from an old negative and then find that the negative is spoiled. Some firms, doing amateur processing work, are very bad offenders in this respect. There is no remedy—except to resolve to do one's own finishing, and to fix and wash properly.

Another most important point. Use reasonably fresh solutions. Fixing and hardening solutions can be used several times over, but, when in any doubt as to their working efficiency, mix fresh. It is always asking for trouble to use stale developer. Buy your photographic materials—this applies also to films, plates and papers—in small quantities from dealers of repute. A host of photographic troubles in India arise from using stale material. It is far better to discard old stocks than to risk spoiling good pictures. Personally I buy direct from the big firms and freely discard any material that I have kept until it is no longer reasonably fresh.

Amateurs in India are often concerned about the storage of undeveloped plates and films when on tour. Photo. firms in India strongly advise development within a few days and this particularly applies to negative material that has already been kept for some months. Personally I have often kept plates, films and film packs for weeks when on jungle expeditions, etc. I have stored them in their original tins or boxes, and placed the latter in an air-tight tin as an additional precaution. This simple method has been quite successful but again I have always taken care to use fresh material

Greenish stains sometimes persist on panchromatic films after fixing. They can easily be removed by

immersing the film for 5 minutes in a 10 per cent solution of sodium carbonate.

Miniature negatives require no special treatment. It is wise, however, to decrease the normal time of development by one tenth in order to secure the material for harmonious enlargements. There are now several special fine-grain developers on the market and these can be used with every confidence. They are intended for miniature negatives when big enlargements are required. With miniature films it is very necessary to make certain that all solutions are of the same temperature. Make up the fixing and other solutions at least an hour before use; otherwise the quality of the tiny negatives is likely to be impaired. Special developing apparatus is sold for "Leica" and "Contax" cameras. It is reasonably priced and much simplifies the handling of the long strips of ciné film.

Intensification and reduction of imperfect negatives are processes that sometimes demand the attention of the experienced amateur and we should therefore briefly refer to them here. If a negative is under-exposed it is often possible to intensify it sufficiently to secure a passable print. What this process does is to increase the opacity of the existing silver deposit. Intensification can never produce deposit where it did not exist before. Less experienced amateurs do not realise this and sometimes seek advice on intensifying negatives that are so grossly under-exposed that there is practically no deposit at all. In such cases neither intensification nor any other process can possibly produce a printable negative. Reduction is the opposite of intensification. In this case the deposit

in an over-exposed negative is lessened and a better print is obtained.

Although there are many formulae for making up one's own intensifiers and reducers, the average amateur so rarely has a negative of sufficient value to demand further treatment that it is not really worth while to keep a stock of the necessary ingredients. All the leading firms like Kodak, Agfa, etc., sell intensifiers and reducers ready made-up and with full instructions for use. A small supply of both in the dark-room is certainly advised. But the amateur must be prepared to discard them, and buy fresh, at reasonable intervals. Never use stale material. That is the slogan for the photographer in India.

A little retouching of amateur negatives is often beneficial and makes a lot of difference when we come to enlarge. Spots occasionally occur on the negative usually due to a particle of dust having settled on the surface of the film before exposure. These can easily be touched out with a tiny spot of colour on the tip of a fine-pointed brush. Similarly it is often possible to deal with harsh shadows occurring in the wrong place by means of a soft pencil or carbon crayon. Such work must be very carefully done, so carefully that nothing shows when the negative is held up to the light. Beyond this simple retouching work the average amateur will not attempt to go. Very useful retouching sets are sold by the leading Indian firms for a few rupees. These firms will also advise on the particular treatment required by any negative or print, and undertake the work themselves if the amateur doubts his ability to do it. Simple retouching, however, can soon be learned by the careful amateur. It is a matter of common-sense and experience.

Printing on gaslight, or bromide, paper is not a difficult process provided a few simple rules are observed. Again we hark back to the same old rule. Use fresh paper. Our climate soon deteriorates printing papers. Obtain small supplies as required. The one-solution developers such as "Azol" can be successfully used to develop prints, but I usually prefer to buy the special developers recommended for any particular brand of paper. I find there is less risk of staining this way.

Any of the well-known brands of printing papers can be used and there is really nothing to choose between them. Kodak "Velox" is one of my favourite gaslight papers; it is easy to handle and gives nice, bright prints even from second-class negatives. A printing frame only costs a couple of rupees.

There is little for even the beginner to learn in gaslight printing. Exposure can be made about a foot away from an electric or kerosene lamp; for negatives of average density between 30 and 40 sec. will usually be required, but this depends upon the intensity of the lamp and must be verified by test. I prefer to work with the developer diluted a little more than advised on the bottle. The image then comes up more slowly and can be better controlled than with the developer at full strength.

Bromide papers must be worked in an orange light. Ordinary subdued lamp-light, such as can be safely used for gaslight papers, would result in fogging if used for bromide. Correct exposure (this must again be ascertained by test) is the secret of successful printing or enlarging on bromide. Staining will always occur if one attempts to force an under-exposed print by prolonged development. Bromide papers will take

about a minute and a half to develop; if the image is either too light or too dark at the end of this time we know that the exposure has been faulty. Only by exposing correctly can we obtain the full range of tones of which modern bromide paper is capable.

After development, gaslight and bromide prints are fixed and washed in the same way as films or plates. As with negatives it is essential to carry out these processes with care if the prints are to be permanent. In so many amateur snapshot albums we see prints that have begun to turn yellow. This is due to insufficient washing and can always be avoided.

The amateur who has acquired some skill in the art of retouching negatives will find that prints can sometimes be improved by the same means.

Both gaslight and bromide papers are made in 3 standard grades—soft, medium and vigorous. Full use should be made of these gradations. Normal negatives print best on “normal” paper, while “soft” is for over-exposed, and “vigorous” for under-exposed, negatives. By this means much can be done to correct errors in exposure of the plate or film—much more, perhaps, than many amateur photographers realise.

Papers are also manufactured with various surfaces. For contact printing I find that “glossy” paper gives the most pleasing results. For enlargement purposes, however, my choice of paper depends upon the class of subject and the use to which the picture is to be put. For press photos, “glossy” bromide should always be used. Night pictures, and broad pictorial effects, print best on a rough surface paper like Kokak “Royal” or Agfa “Brovira”, matt grained.

It is always desirable, though by no means essential, to glaze prints that are to be submitted to newspapers or magazines. Glazing is quite a simple process. Special plates of suitable size can be bought quite cheaply. These are made *scrupulously* clean, treated with a special glazing solution and the soaking wet prints are squeegeed on to them. When dry, the prints can be stripped off without damage to the highly glazed surface. Glazing solution can be brought from all the leading photo. dealers in India.

The inexperienced amateur often encounters trouble, however, when he comes to strip off the dry prints. They do not come away easily from the glazing plates. This is due to insufficient cleansing of the plates before use. Washing the plates in hot water, to which a little washing soda has been added, must be most carefully done. They must then be rinsed in several changes of water before the glazing solution is applied. Squeegeeing should be done steadily so as to force out the moisture from the centre to the edges. Drying must be slow and regular otherwise the print will come away at the margins and markings will appear.

Enlarging is a most fascinating branch of photographic work. While contact printing makes photographs, enlarging makes pictures. There are few contact prints that cannot be improved by the elimination of some part of them. With the enlarger one can take a small portion of a negative and turn it into a picture.

With miniature cameras enlarging almost becomes a necessity. It is possible, certainly, to make contact prints from 1½ by 1 inch negatives but they cannot do justice to the marvellous definition of which miniature camera lenses are capable. It is only the enlarger

that can bring out all the microscopic detail present in the negative.

“Camera shake”, due to unsteady holding of the instrument when the shutter is released, is responsible for much disappointment when enlargements are made. Though the image may appear sharp in the contact print, enlarging to 3 or 4 diameters immediately reveals a blurring of the image. This applies particularly to miniature cameras, which by reason of their small size and light weight are more difficult to hold rock-steady than larger instruments. Yet absolute steadiness during exposure is essential for successful enlarging.

The question of expense prevents many amateurs from installing an enlarger. In India, the problem of a suitable illuminant also presents difficulties. Where electricity is not available, acetylene can be used and details with regard to this lighting can be obtained from any of the English dealers listed at the end of Chapter II. Acetylene lighting outfits, by themselves, are not expensive. They can be obtained in England for round about £1. But the trouble is that there are only certain designs of enlarger to which they can be fitted. All details can be obtained from the dealers noted above.

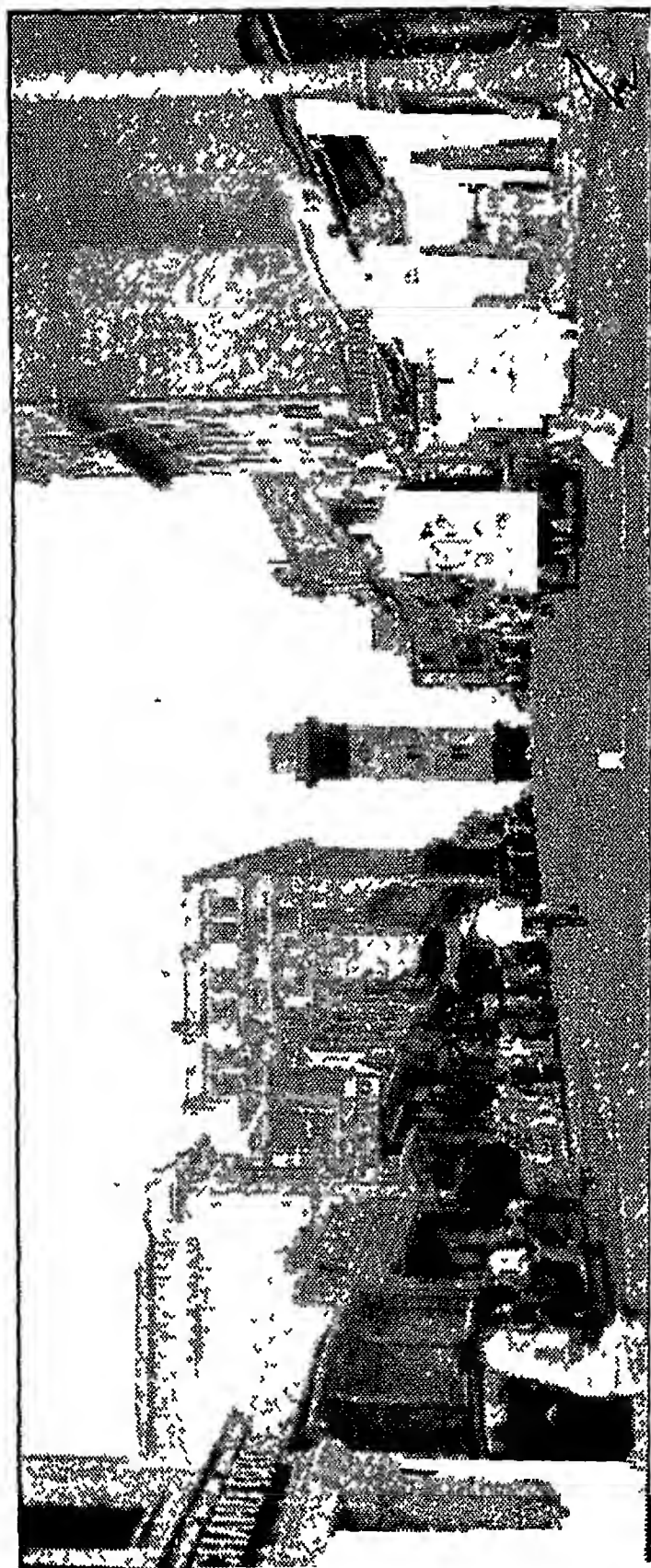
The ordinary type of vertical enlarger marketed in India can only be used with electricity. Messrs, Kodak have recently brought out a very efficient amateur enlarger at a most reasonable price. For certain types and sizes of camera enlarging attachments are available by means of which negatives can be projected through the camera itself. These attachments are very useful for amateurs. Well-known devices of this type are the Zeiss Ikon “Mirax” (sold by Messrs. Adair, Dutt at Rs. 40) and the Ihagee

“Lumimax” (particulars of which can be obtained from Messrs. Mangalbhoj & Co.) They enable the amateur to undertake his own enlarging with the minimum of expense.

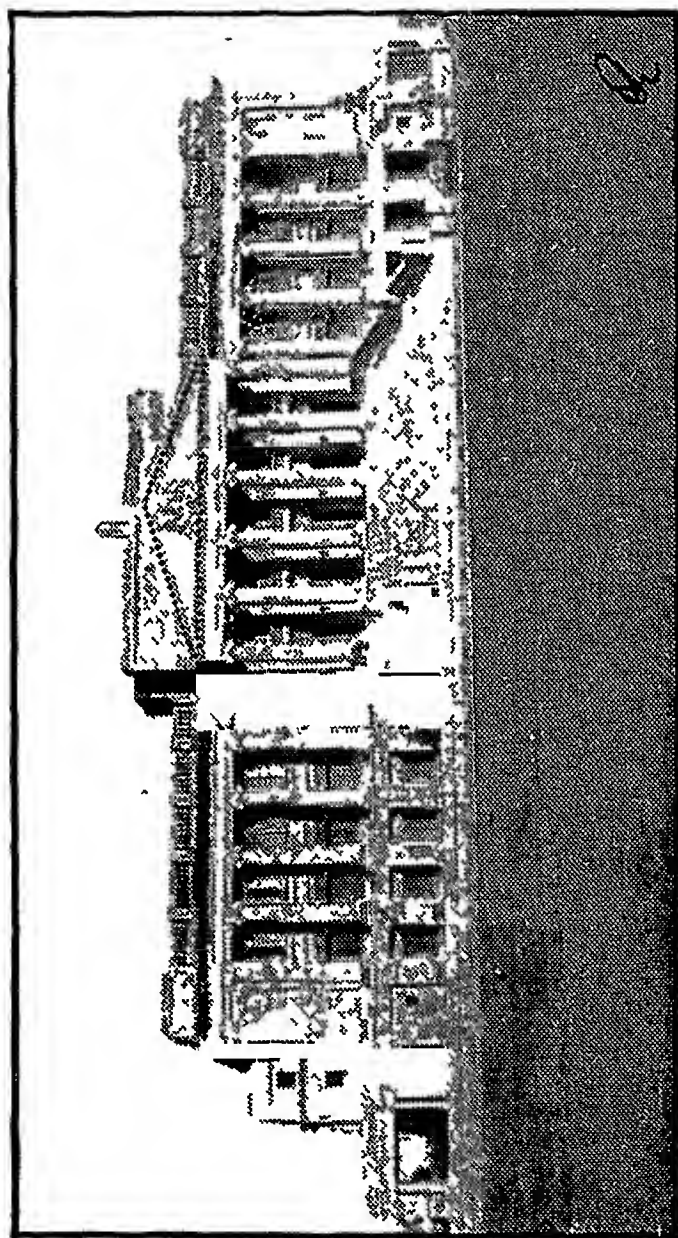
For those who can afford it there is a very wide range of most efficient electric enlargers available. The latest models of all the well-known makes are fitted with automatic focussing. This enables one to dispense with the task of focussing on a screen until the sharpest degree of focus has been determined. One merely sets the enlarger to any required degree of magnification, puts the negative and bromide paper in position and switches on the light.

Such instruments naturally cannot be cheap. The Zeiss Ikon “Miraphot” automatic focussing enlarger, for instance, ranges in price from Rs. 100 to Rs. 182, according to size and the speed of lens fitted. Other similar instruments cost just about the same.

For miniature-camera owners special enlargers are sold. They enable whole-plate prints to be obtained from the tiny negatives with the greatest ease. The quality of these prints depends, however, upon the skill of the photographer. Steady holding of the camera, and approximately correct exposure of the negative, become matters of vital importance when we come to enlarge up to such great magnifications. Haphazard methods, especially in India, will never enable miniature cameras to yield the best results. Enlarging is very fascinating but it certainly does demand the closest attention to detail when the negative is exposed and developed. This applies to all sizes of cameras and it is a point that has always to be borne in mind by the amateur photographer in India who wants to produce distinctive work.



AN PARISIAN THOROUGHFARE " Exposure, 1/50 sec at f 11 on 'chrome film Always expose for the shadows



"CEYLON'S 'HOUSE OF COMMONS'" White architectural subjects only
require half normal exposure

CHAPTER V.

PICTORIAL WORK.

Not long ago the writer was shown a collection of pictorial photographs taken on an Eastern jungle trip through almost unknown country. It was clear from the photographs that there were abundant possibilities for the camera. But what should have been a most interesting photographic series had been completely spoiled by the operator's ignorance of pictorial composition and technical requirements. Instead of a striking collection of photographs, some of which could have been sold to the newspapers and magazines, this amateur had hardly a decent print to reward his efforts.

This proves once more what a small part luck plays in successful photography. Precision of thought and action are the qualities that yield distinctive pictures. This requires particular stressing with regard to landscape work in India where lack of scenic variety often has to be compensated for by ingenuity on the part of the man behind the camera.

The "pretty-pretty" effects so easily secured in temperate climates are not easy to find out here. Our scenery has a charm of its own, an attraction of bolder and simpler outlines, deeper shadows and brighter highlights, that, if no less attractive as a camera subject, certainly requires more skill in its representation. Much fine pictorial work has already been done in India. Yet there is still ample scope for new ideas—new

subjects, new treatment. Novelty will always command attention. In this respect amateur photographers in India enjoy a great advantage

The term "pictorial" covers a wide range of different types of subject. In fact, any subject can be so represented that the resulting photograph falls into this category. The test is whether the photograph can stand on its own merits as a picture. Many portraits, for instance, can be described as pictorial photographs. Then there are landscapes, seascapes, street scenes, genre pictures (i.e. portrayal of scenes from ordinary life), still life, night pictures, action studies and many other types of photographs that come into the pictorial class. The distinction is one of merit rather than of subject.

The correct pictorial treatment of any subject falls more or less along established lines. Pictorial composition, or the arrangement of the subject and surroundings so as to yield a balanced picture, is as important for serious photographers as for landscape painters. Yet there are many amateurs who give it little thought. As a result, their photographs rarely get beyond the casual snapshot class.

While careful study of exhibition and competition pictures is the only way in which to acquire the right ideas, it is possible to indicate the principles upon which the theory of pictorial composition is based. With these principles in mind the student can dissect the pictures of established pictorial workers with greater ease

Unity is the object of all pictorial composition. The finished picture should be complete in itself and must contain neither more nor less than is necessary to

convey the desired effect. It will be observed that many of the finest pictorial photographs are simple in the extreme. They contain very little but, just as the hand of the master artist can convey the effect it desires with the minimum of effort, so the expert photographer will often rely upon simplicity for the representation of his basic idea. In this connection it should be noted that amateur pictures as a rule contain too much rather than too little.

Granted, then, that unity is the quality that we have to aim at in our pictorial work, how can it best be secured? The simplest way is to pick out the most important feature in the scene before the camera and to contrive that other objects take up a subordinate position. Study of successful pictorial photographs will show how this can be done.

Unity can also be obtained by repetition, continuity or radiation. In the first case, a group of objects in one part of the picture is balanced by a group of different objects on the opposite side. A sense of informal symmetry is thus conveyed. In the second case, a number of similar objects are so arranged that they lie in orderly succession. The eye is automatically steered from one to the other and a complete impression of unity is given. Radiation is another variation of the same idea. In this case, all the lines or objects in the picture are placed in orderly relation to some central point. To whatever part of the picture the eye is directed it will be drawn towards the centre, or point of unity.

These, then, are the most important theoretical points to which the attention of pictorial photographers has to be directed. Experience and study will teach

the amateur how to choose his view-point and arrange his lighting so that harmonious unity is secured. Those with an artistic sense will learn far more quickly than their less gifted fellows. For it has to be remembered that the photographer's own sense of artistic beauty plays a very big part in the production of distinctive pictorial photographs.

It is for this reason that a reflex camera, whether of the miniature or full-size type, is of such enormous help in pictorial work. With the picture on the screen to guide us, it is possible to vary the view-point until we catch a distinctive scene, or to manipulate the camera so that even a hackneyed subject appears novel and pleasing. Then, provided that our eyes are competent to assess artistic values correctly, we can safely disregard theoretical considerations, although in the majority of cases we shall subsequently discover that what has appeared artistically correct to our trained judgment is also correct according to theoretical rules.

Shadows are of particular importance in landscape work in India. A brightly lit subject, unrelieved by shadow contrast, is unlikely to make a successful picture. Morning and evening in India, when the rising or setting sun is casting shadows and playing attractive tricks in oblique lighting effects, are the times for pictorial photographers to choose.

Clouds are another difficulty out here. Often our skies are too glamorous and artificial to provide a suitable setting for a landscape scene. Alternatively they contain no clouds at all. However strongly the purists amongst us may object to artificial aids to photographic success, there is often no alternative to

printing in clouds from another negative. In fact, the prudent photographer in India will neglect no opportunity of providing himself with an assortment of suitable cloud negatives for this purpose.

Combination printing, the working details of which are explained in the Appendix on page 141, presents little difficulty to experienced workers provided the cloud negative is suited in lighting and effect to the picture in which it is to be used. The ideal cloud negative for printing in should be thin and devoid of violent contrast. Soft gradations of tone are the results to aim at

Orthochromatic, or, better still, panchromatic, plates or films should always be used for landscape and other pictorial work in India. In many types of subjects there is an abundance of colour and it requires a colour-sensitive emulsion to interpret the correct values in monochrome, and to preserve the variety, vitality and charm of many typically Indian scenes.

A colour filter on the lens is also of great assistance. In fact, it is a sound plan always to use a pale yellow filter (K.1) for outdoor work in India. Not only is the risk of over-exposure lessened but a more harmonious picture is secured. Colour filters of varying density, requiring stated exposure times, can be bought quite cheaply and no photographer in this country should be without one.

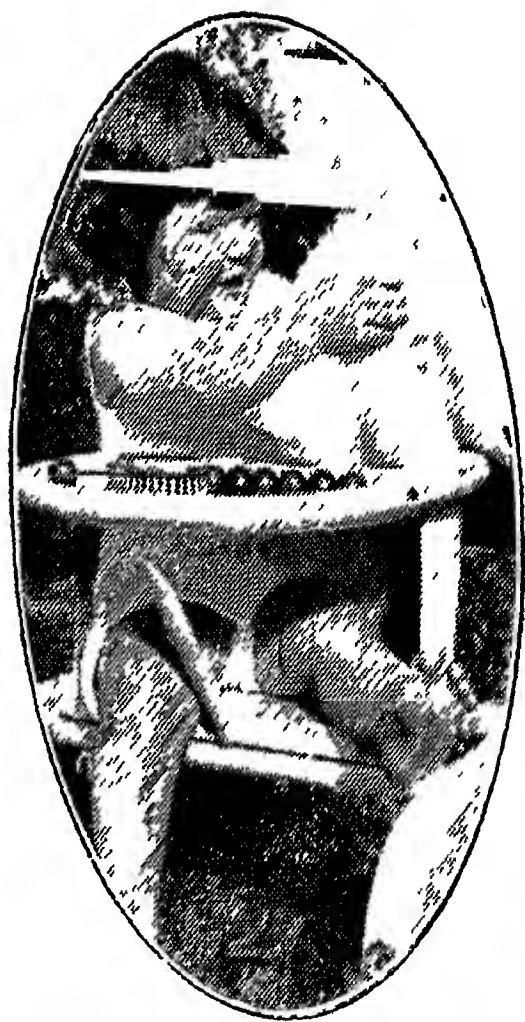
A lens hood is also a most necessary item of equipment. Against-the-light photographs are becoming increasingly popular. In fact a recent World Photographic competition was won by a photograph of this type. To secure the fascinating effects that such pictures reveal, the photographer has to remember

three essential points. Give double the exposure time, use anti-halation films or plates; invest a few rupees in a lens hood and always use it for against-the-light pictures to prevent the direct rays of the sun striking the lens and fogging the picture. Some amateurs always have a hood on the lens for outdoor work. For Indian pictorial photography this is a wise precaution.

An enlarger is a valuable aid to pictorial success. Not infrequently it occurs that a small portion of an uninteresting picture will yield a fine result if the amateur is clever enough to spot its possibilities. Skill in using the enlarger has produced many a distinctive picture.



" RHENISH GARDENER " Taken with a 30-cm Zeiss Tessar lens on a 9 by 12 cm plate Long-focus lenses are invaluable for the production of distinctive portraits
(Photo by Curt Hege, reproduced by courtesy of Messrs Carl Zeiss)



"HER FIRST BIRTHDAY"
Natural child studies containing plenty of
wholesome sentiment, are popular with
competition judges all over the world

CHAPTER VI.

PORTRAITURE.

Photography has many fascinating applications but none more fascinating than the portrayal of human nature by means of the camera lens. No portrait can be successful if it does nothing more than record the physical outlines of the sitter's face and figure. Only when it contains something more, something indefinable that throws a revealing light upon the subject's personality, can it be called a portrait in the true sense of the word.

As examples of pictorial and technical perfection readers should study the portraits hung at the big exhibitions in England and India. These are always reproduced in the photographic or ordinary press. Cuttings can usefully be filed for future reference.

Although comparatively few amateur, or even professional, portraits reach such heights of perfection, no photographer need despair of achieving some success in this difficult branch of amateur work provided he will take the trouble to master its technical requirements.

Probably in no other branch of photography is it so essential to plan out the picture beforehand and to decide how the desired effect can best be obtained. To rely on the inspiration of the moment, or to fire off a number of shots in the hope of securing a lucky winner, is not the way in which to produce distinctive portrait studies.

The ideal instrument for amateur portraiture is undoubtedly a camera of the reflex type, fitted with as large an aperture lens as the photographer can afford. Miniature cameras are being increasingly used even by professional photographers in France and Germany for the production of distinctive work. Twin-lens reflexes of the "Rolleiflex" type are very successful for portraiture, by the use of the "Megaflex", or similar attachments, cameras like the "Leica", "Contax" and Nagel "Pupille" can be converted into reflexes for the time being.

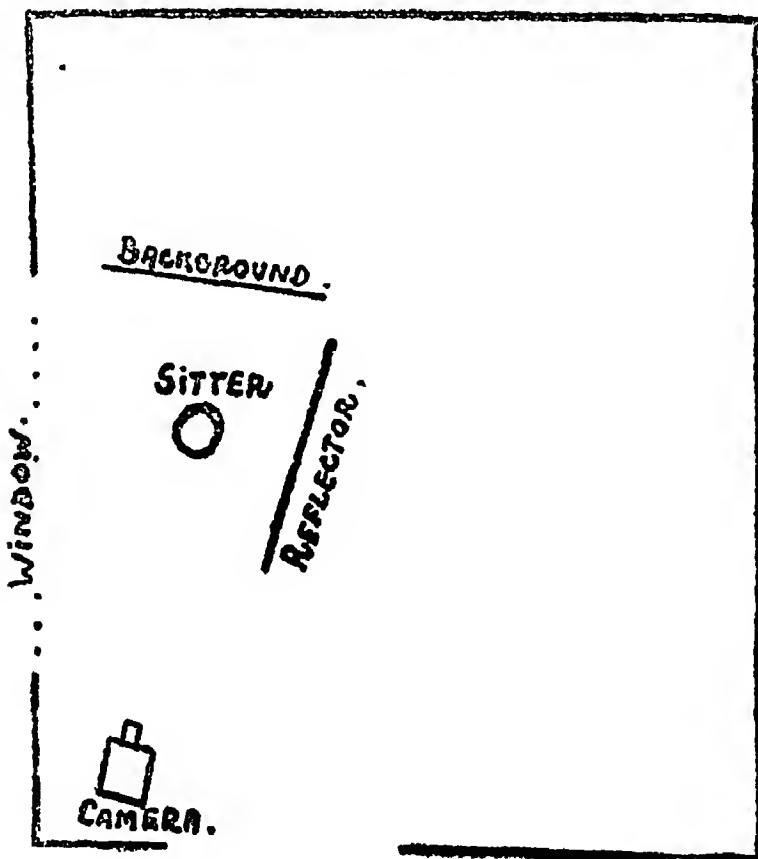
The reflex arrangement permits one to study the effects of lighting and posing as they will actually appear on the plate or film. A lens, working at large aperture, allows short exposures even indoors and gives a pleasing neutral softness to the background. This is of particular importance when a screen is not placed behind the sitter.

For the specialist in amateur portrait studies, special portrait lenses of longer than normal focal length can be purchased at reasonable prices. Or a telephoto lens, such as is bought nowadays by many amateurs to interchange with the normal lens fitted to their camera, will give excellent results.

Although such devices are of great assistance in portrait photography, the amateur with a cheap hand camera need not imagine that good results are unobtainable without costly apparatus. The cheapest modern camera is fully capable of tackling portrait work and giving good results provided its limitations are realised. It is advisable, for instance, with this type of camera, to confine one's efforts to full or three-quarter length portraits and simple lighting effects.

Unsuitable lighting arrangements and discordant backgrounds are common causes of failure both in outdoor and indoor portrait work. We will deal first with the difficulties encountered indoors. Few amateurs can spare even a corner of a room for a studio and are therefore obliged to improvise lighting devices and backgrounds. Fortunately this is not so difficult as might at first appear.

The most pleasing results are obtained by means of cross-lighting, one variation of which is shown in the accompanying diagram. A suitable background can be arranged by hanging a length of grey material behind the sitter. A reflector can be improvised by



One variation of suitable lighting for indoor portraiture

attaching a piece of grey calico to a 4ft. square frame. Changing the relative positions of reflector and sitter will produce variations in the results obtained.

For indoor work the fastest plates or films are advisable. Panchromatic material is particularly suitable. This enables the exposure to be cut down to the minimum and the sitter is spared the ordeal of prolonged posing. With camera-shy sitters this is particularly necessary. There is, moreover, less risk of harshness with fast films

For indoor work by artificial or poor light, supplementary lighting equipment is usually essential except

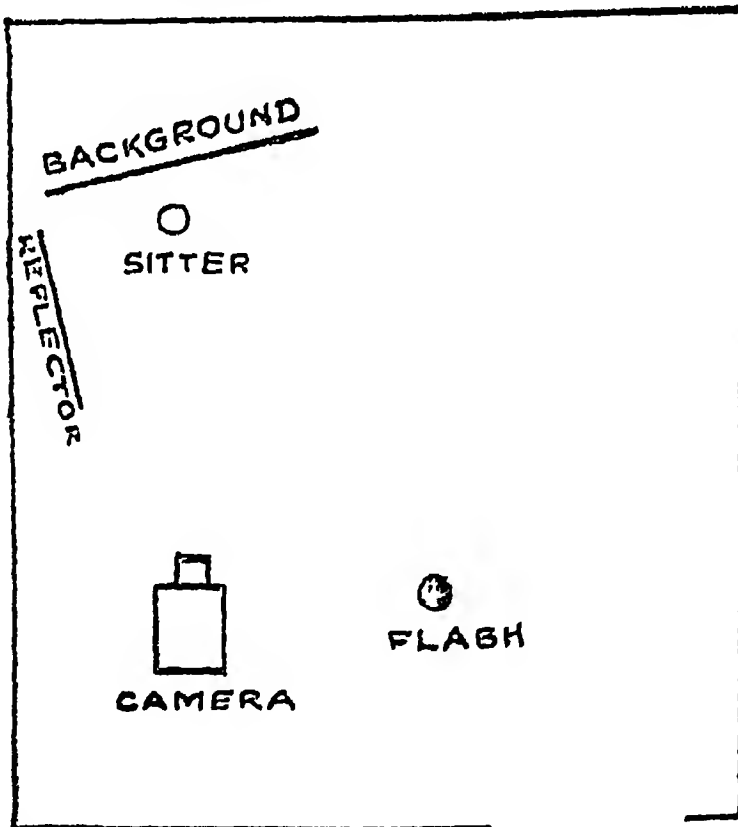


Diagram showing a suitable lighting arrangement for an indoor flashlight portrait. The distance between camera and sitter will depend on the strength of the flash. This can be ascertained when buying the bulb or powder.

with ultra-rapid lenses. It is useless to expect a natural portrait if your sitter has to hold a pose for any length of time. The leading manufacturers now sell special equipment for amateur indoor lighting. First-class results can therefore be obtained independent of the speed of your lens

A very suitable amateur outfit is the "Kodaflector," marketed by Messrs. Kodak, Ltd, at Rs. 20 plus "Photoflood" bulbs (equal to 7 ordinary 100-watt bulbs) Rs. 6 each.

Equally efficient equipment is obtainable from Messrs Agfa, Ltd, Messrs. Adair, Dutt & Co. ("Zeiss Ikon"), Messrs. Houghton Butcher, Ltd. ("Ensign") and others, at prices ranging from Rs. 18 to Rs. 50 according to the range and capacity of the lighting

Very useful devices, too, are the photo. flash bulbs sold nowadays. They have largely replaced flash powder for amateur work. They are more convenient, safer and well worth the extra cost. These bulbs are fitted to a reflector and "fired" by means of any electric torch. When the button of the torch is pressed the flash goes off. The Agfa "Photoflux", and "Sashalite" (sold in India by Messrs. Kodak, Ltd.) at Rs. 2 each are well-known bulbs of this type.

Portrait photography at Rs 2 a time (for these bulbs will only give the one flash) is admittedly costly. Nevertheless, their advantages over the cheaper flash-powder are so marked that the Indian amateur will be well-advised to use them when circumstances demand the use of a "flash." For those to whom economy must be the first consideration, the "Barrett" Synchronised Flash Lamp, recently placed on the English market at £1, will prove a real boon. It uses flash-powder, is therefore cheap to run, yet reliable and safe.

Flash bulbs and flashpowder are both worked in the same way. The shutter is opened just before the flash and closed immediately afterwards. There is one very important point. Hold the flash above your sitter. An angle of 45 degrees between the lamp and the head of the sitter is about right. If he is seated on a chair and you stand with the flash held above your head, that will usually be sufficient.

The camera should be on a tripod. You stand to operate the flash a short distance to one side of the camera, and level with it. This is shown in the accompanying diagram.

The distance at which you can work from your subject depends, of course, on the strength of your flash. Flash bulbs give a standard illumination and the distances are given by the manufacturers. With powder, too, the dealers will tell you how much is required when working at various distances.

Outdoor portrait work presents greater technical difficulties especially in our glaring Indian light. Portraits taken in sunlight are rarely successful. Harsh shadows and screwed-up eyes ruin what might have been an attractive "snap."

It is far better to use diffused light. The following method, for instance, almost invariably yields pleasing pictures and is particularly successful with feminine sitters. Place your subject with the strong afternoon sun slanting down upon her from behind and get her to hold a pale pink silk parasol behind her head. Fit a lens shade and give full exposure. The finished picture will not be a disappointment.

Fast films again give the best results and due attention should be paid to that useful rule—"full exposure and short development for portraits."

With the parasol lighting arrangement mentioned above, $1/50$ sec. at f. 4.5 is about right for diffused afternoon sunlight in India.

If no special arrangements are made to secure a harmonious background, then it may often occur that undesirable objects intrude into the picture and distract attention from the subject. This is often the case with portrait "snaps." A charming and natural picture is completely spoilt by an ugly and discordant background.

Fortunately the background can easily be dealt with after developing the negative. Special substances (obtainable from all the leading photographic firms in India) are sold for painting over the undesired parts of the negative so that light cannot pass through. A white background is therefore obtained when the negative is printed or enlarged. If the amateur is not prepared to do this himself any photographic firm will undertake the job.

Many portraits owe their charm to the clever use of diffusion. Over-emphasis is the danger. Exaggerated soft-focus effects should be scrupulously avoided.

Professional photographers use special lenses for soft-focus work. If one is really keen, and possesses a suitable type of camera it is worth while to buy a lens of this type to interchange with the lens normally used. For a $3\frac{1}{2}$ by $2\frac{1}{2}$ camera such a lens can be bought for round about Rs. 75. Second-hand bargains could probably be obtained from the English dealers listed in Chapter II at half this price. But very careful inquiries would have to be made to ensure that one's camera was suitable. With lenses of this type one must not as a rule stop down much as the degree of

diffusion given decreases with the lens aperture until the image becomes quite sharp.

Failing this, a diffusion screen to fit on to the front of the lens in the same way as a filter or portrait attachment will give quite satisfactory results. Such screens are sold by several of the big photographic dealers in India at prices round about Rs. 15

Or, if the amateur does his own enlarging, very pleasing effects can be secured at no cost at all. All that has to be done is to hold a piece of plain glass in front of the lens of the enlarger for half the time of exposure. The glass will refract the light rays sufficiently to cause a softness of the image on the bromide paper. Some enlargers are fitted with special diffusion screens by means of which similar results can be obtained. If one has to rely on photographic firms for one's enlarging they can easily produce the effects required.

Catching the personality of the sitter—the vital point in all portrait work is a subject on which it is difficult to lay down hard and fast rules. It is largely a matter of experience, artistic sense and quick-wittedness in making the exposure at exactly the right moment.

The great extent to which the eyes express facial expression is not generally appreciated by amateur photographers. This is of the greatest importance in portraiture. Watch the sitter's eyes for expression and, when they convey the vivifying effect you desire, make the exposure at once. Personality is more readily revealed by the eyes than by any arrangement of lighting and posing

Then there is child photography. Probably more amateur "snaps" are taken of children than of any other subjects. Unfortunately many of them are the

reverse of successful. The test of merit for a child snapshot is whether it interests anybody other than the parents of the child. This may appear obvious but it is surprising how large a proportion of the contents of amateur photographic albums fail to pass such an elementary test.

Posing, or artificiality in any form, is fatal in child portraiture. Aim at a natural picture above all things. Children immediately assume self-conscious attitudes when faced with the camera lens. Take them unawares and get them smiling. A happy smile makes all the difference. You will notice that in nearly all the most distinctive child portraits the subject is smiling. Happiness should always be the keynote of child pictures. Infinite patience and extreme quickness in operating the camera release at exactly the right moment are required to secure this result.

The success with which the modern miniature camera tackles child photography merits special comment. With an ultra-rapid lens, and quick film winder, it is possible to work all the time at top speed. Far fewer pleasing pictures are missed than when working with a bulky $\frac{1}{4}$ -plate camera.

Moreover, these pocket camera possess the merit of unobtrusiveness. With the twin-lens type it is possible to operate the camera when facing at right-angles to the subject, or even when facing in the opposite direction. Such devices are of great assistance in securing natural child studies. In fact, for child photography, the miniature camera can be said to be ideal.

CHAPTER VII.

RAPID ACTION PHOTOGRAPHY.

The attractions that a good action photograph has for the average layman is evidenced by the large number of excellent sporting pictures that are reproduced in the newspapers. The majority of readers are more interested in action pictures than in any other type of published photograph.

This means that any first-class amateur speed snapshot will not only be a source of perennial interest to a photographer's friends, but it will also stand a good chance of a prize in photographic competitions.

.. The ideal instrument for rapid action work is a folding focal-plane camera with a direct vision viewfinder. A focal-plane shutter, although not absolutely necessary for many action subjects, is a great advantage, for it permits of higher speeds than are possible with a shutter of the diaphragm type.

The majority of press photographers use $\frac{1}{4}$ -plate or larger cameras for action work. Yet the miniature camera is almost equally successful for speed subjects. In fact, the rapidity with which a number of exposures can be made is often a great advantage. For instance, the writer was recently shown three fine photographs of the successive stages of a racing car smash that could only have been secured with a miniature camera. A $\frac{1}{4}$ -plate camera operator would have been obliged to be content with a single photograph. But, in support of the larger camera, it must be remembered that the

margin of error when using miniature cameras is often so small that the one $\frac{1}{4}$ -plate negative may easily be worth more than the three or four miniatures.

Reflex cameras, although unsuitable for action photography when used in the normal way, can very easily be fitted with a detachable wire-frame finder to permit their manipulation at eye-level for speed subjects.

The type of folding amateur camera that is fitted with a diaphragm shutter speeded up to 1-250th or 1-300th of a second, and a lens working at f.4.5 or f. 6.3, can be successfully used for all but the most difficult speed work. Even less efficient instruments have produced fine action photographs

Taken all round, rapid action photography is probably the most difficult branch of amateur work. If the camera enthusiast is to rely on anything more than mere luck for his finest results, he must cultivate the powers of rapid thought, rapid manipulation and, more important still, anticipation.

It has been proved that a definite interval must elapse between the seeing of an object and the pressure on the shutter release. Even with the most experienced workers this interval can never be reduced below 1-10th sec. With a speed subject, as, for instance, a horse jumping a fence, much can happen in 1-10th second. The photographer is therefore obliged to anticipate the horse's movement and decide to make the exposure 1-10th sec. before the most interesting point of the jump is reached. During this short interval, while the nerve stimulus is passing from the eye to the brain and from the brain to the hand, the

horse reaches the highest point of the jump and the perfect action picture results.

Experience alone can teach an operator how to anticipate the most interesting moment in sports photography. At football matches, at race meetings, in the swimming pool, on the tennis court and at other sports venues, there are certain moments of particular interest and excitement. Imprison those momentary incidents on the photographic plate or film and the resulting picture tells a story more vividly than it could ever be told by spoken or written words.

Besides sports photography of this description there are numberless action studies of family and personal interest that provide splendid opportunities for the alert amateur. A "snap" of the baby making his first efforts to wobble along the bungalow verandah will, if taken at just the right moment, prove of far greater and more permanent interest than any actionless portrait study. Similarly, in the jungle, on the sea beach, in the towns and villages—in fact, wherever the amateur photographer may go in India—there are hundreds of everyday incidents that will yield striking action pictures if "snapped" at exactly the right instant.

Apart from the difficulties involved in manipulating the camera shutter at the moment of greatest interest, the technical problems arising in rapid action photography mainly concern the calculation of the correct exposure. While the strength of the light is the factor that determines the length of exposure in other branches of photographic work, there is another and far more important consideration in speed photography. In this case, we have to determine the shutter speed

required to arrest the movement of any particular object so as to give a sharp and unblurred image on the plate or film.

The shutter speeds required to secure this result depend upon the speed of the object, its distance from the camera and also upon the equivalent focal length of the lens. As the text-books tell us, mathematical calculation of these three factors will give us the exact time of exposure required for any particular subject. But mathematical formulae are quite useless to the photographer when he is working on a rapid action subject. Before he had time to get busy with his notebook and pencil his fine action scene would have disappeared.

So we are obliged to find a more practical method of tackling the problem. The soundest plan is to group action subjects as follows and, whenever possible, always to give the maximum exposure indicated for each group :—

| TYPE OF SUBJECT | Diaphragm shutter. | Focal-plane shutter. |
|--|--|------------------------|
| Street scenes, waterfalls, animals or children at play in fact, any scene in which the action can be described as moderate | $1/100\text{th sec}$ | $1/200\text{th sec.}$ |
| Football, tennis, athletics or any other rapid action subject of this type | $1/250\text{th}$ — $1/300\text{th sec}$ (Do not take at less than 15 yards from subject) | $1/500\text{th sec}$ |
| Car racing, high diving, express trains, horse jumping—extreme speed subjects | $1/300\text{th sec}$ (Do not take at less than 30 yards from subject) | $1/1000\text{th sec.}$ |

This must not be taken as more than a guide to correct exposure. Common-sense will often indicate

occasions when it can be modified with advantage. For instance, it is obvious that it would not be necessary to give as short exposures for an express train taken from a considerable distance away as when we were standing beside the track. Although the train would be travelling at the same speed in both cases, the image on the plate or film would not. And it is the motion of the image that we have to arrest.

Similarly such subjects as children and animals at play may sometimes require shorter exposures than given in the table. Again the distance from the camera is of great importance. The nearer the subject is to the camera, the greater will be the movement of the image on the plate and the shorter the exposure required to arrest it. In difficult cases it is best to give the shortest exposure the light will permit.

Unfortunately, unless one's camera is equipped with an extremely rapid lens, it not infrequently occurs that the light is not strong enough to allow the shutter to be speeded up as much as the subject is judged to require. Under these circumstances the photographer has to do the best he can. He must try to make up for the lower speed by choosing a moment of partially arrested action (as occurs, for instance, when a horse reaches the highest point of its jump over a fence), or by increasing his distance from the subject. In this connection it is interesting to note that it is possible to "snap" a man 6 yards away walking at right-angles across the field of view of the camera at 1-15th sec. and yet secure a perfectly sharp picture. This exposure would even be sufficient for a horse leaping a fence at 15 yards provided the photographer was clever (and lucky) enough to choose the correct fraction of a second

for operating the shutter. No experienced photographer, however, would set himself such a difficult and risky task unless the light forced him to do so.

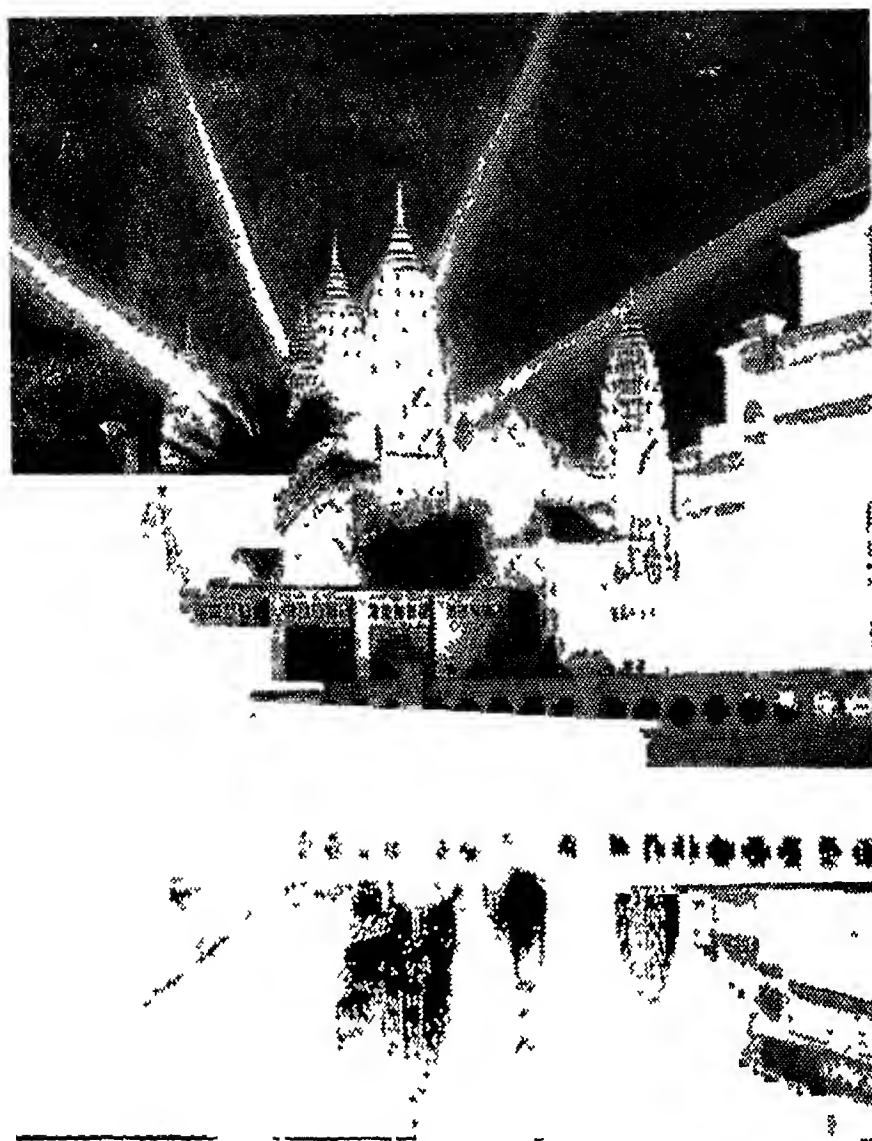
To a certain extent such contingencies can be avoided by always using the fastest plates and films obtainable for high speed work. Such plates and films as Zeiss Ikon "Pernox", Agfa "Isochrome", Perutz "Persenso", Barnet "Super-Press" and Ilford "Double-X-Press" are particularly suitable when speed is the primary consideration.

In India, however, our light does not fail us so frequently as in European countries and it is often desirable with less rapid subjects to stop down the lens to avoid over-exposure and to improve the definition. For instance, in ordinary sunlight out here, 1-1000th sec. would often be a quite suitable exposure for a well-lit action subject at a lens aperture of f.3.5. If one were taking an open street scene in this light, it would usually be advisable to stop down to f.8 and still adhere to the given group exposure of 1-200th sec.

Particularly with super-speed subjects, such as racing cars or high dives, the amateur photographer often gets results that, while technically excellent, are disappointing in that they fail to give the impression of fast movement. All that has been done is to convert speed into stillness.

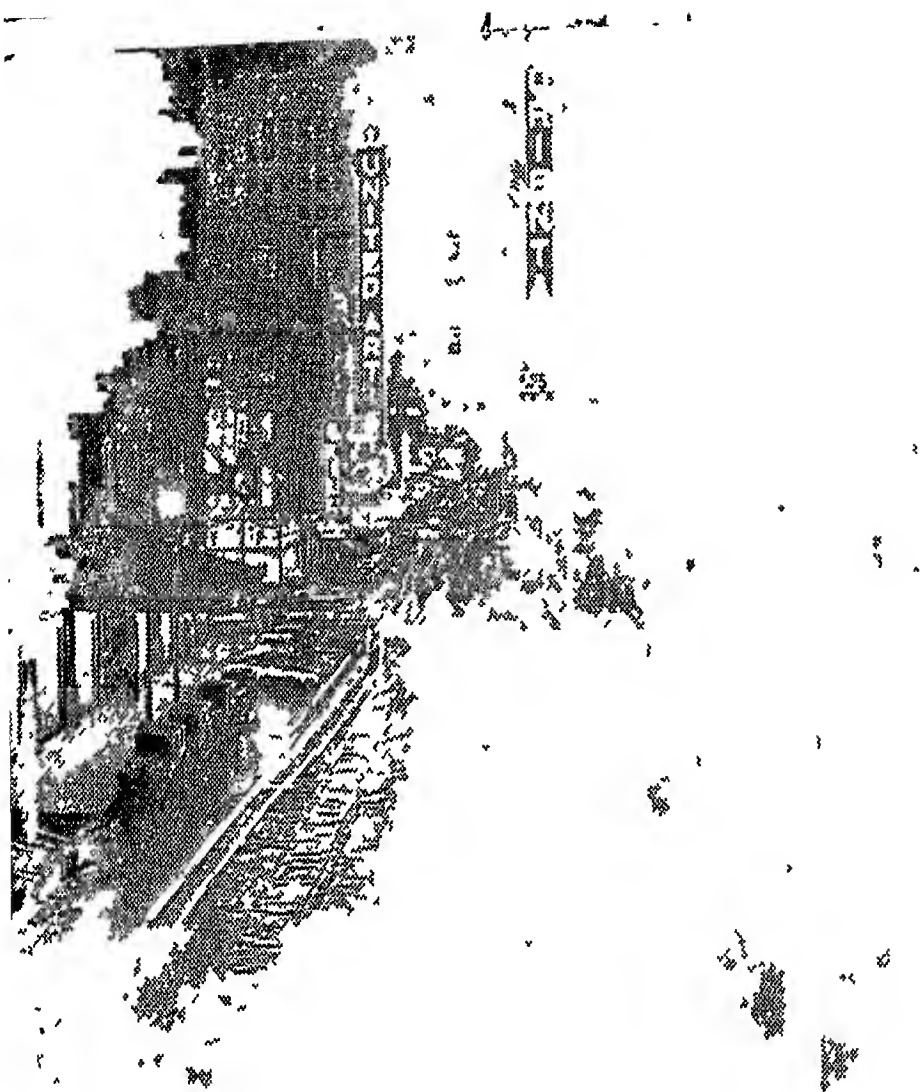
The way to avoid this effect is to choose the moment and manner of exposure with the greatest care. For instance, expert photographers operating on racing tracks often choose a position where a slight bump makes the cars jump into the air as they roar past. Four wheels all off the track give a fine impression of

speed. Or, it is possible by following the car with the camera to create a blurred background that conveys a similar impression. With other subjects, athletics or tennis, for example, it is similarly possible to take advantage of a particularly effective moment or setting. Ingenuity and experience are the secrets of successful speed rendering.



"COLONIAL EXHIBITION IN PARIS"

Another striking "Rolleiflex" night "snap"
(Reproduced by courtesy of Messrs Franke and Heidecke)



" RANDOLPH STREET, CHICAGO "

Taken with a "Rolleiflex" camera.
Street scenes at night often make novel
and attractive subjects for competition
prints.

(Reproduced by courtesy of Messrs. Franke & Heldecke)

CHAPTER VIII.

NIGHT PHOTOGRAPHY AND NEW ANGLE WORK.

The introduction of super-speed panchromatic films and plates has made night "snapshotting" possible for those amateurs who possess a camera fitted with a lens of f.3.5 or larger aperture. With a lens working at f.4.5, or even f.6.3, it is possible to give brief time exposures for well-lighted night scenes and secure perfect pictures.

Many amateur photographers are therefore able to compete in this fascinating and novel field with the certainty of obtaining good results after a short period of probation.

Supersensitive panchromatic plates or films (e.g. Kodak, Agfa or Ilford) must be used for night photography. The latest films of this type are fully three times as fast as the most speedy 'chrome material. The amazing progress made in the production of high speed plates and films is appreciated by no one more than the night photographer. Not so many years ago workers in this field were often obliged to make two exposures—one at dusk to secure the outlines of the subject and another after dark for the lighted lamps and other night effects. Combination printing was then resorted to but the finished picture was rarely a success.

All that has been changed by the introduction of super-speed "pan" emulsions and extreme aperture

lenses. Miniature cameras are ideal for night work. The lenses fitted to these little instruments, when working at their widest aperture of f.3·5, f.2·8, f.2 or even f.1·5, will still retain sufficient depth of focus to give a sharp picture of objects at varying distances from the camera.

This is due to the short focal length of miniature camera lenses and is of the greatest importance in night photography when the lens nearly always has to be used at its maximum aperture. A $\frac{1}{4}$ -plate camera operator, tackling a similar subject with an ultra-rapid lens of f.2·9, would be obliged to compensate for the shallow depth of focus of his $5\frac{1}{2}$ or 6 inch lens by getting further away from the subject.

While the miniature camera would give a sharp rendering of the entire subject at, say, 15 ft. from the nearest object, the $\frac{1}{4}$ -plate instrument would have to be operated at 30 or 40 ft. to secure the same result. For normal daylight subjects, the $\frac{1}{4}$ -plate operator would stop down his lens, and give a proportionately longer exposure, to avoid this contingency. At night he cannot do this without setting his instrument on a tripod and giving a time exposure, which is impossible for a very large number of subjects containing movement.

In fact, so successful is the fast lens miniature camera for this branch of modern photography that the amateur, who prefers a large size instrument for normal working, might consider the advisability of acquiring a miniature instrument specially for night "snaps."

For there is no doubt that this novel branch of photographic work has a great future before it. That India is not lagging behind is clearly demonstrated

by the fine prize-winning entries in a Bombay newspaper's night picture competitions. Indian specialists in night photography, however, cannot expect to do themselves full justice unless they can manage to take advantage of the latest miniature camera aids to success

Trouble sometimes arises when using panchromatic films in amateur cameras due to the red window at the back of the camera being unsafe for "pan" emulsions. Light filters through and partially fogs the film. The latest designs of folding amateur cameras are light-trapped to prevent this irritating fogging. Older models can usually be light-trapped by competent photographic dealers at a small charge.

The problem of exposure times in night photography cannot be solved by theoretical rules. Experience again is the only reliable guide. It is only possible here to indicate the sort of exposures required for one or two promising types of night subjects, using super-speed "pan" film. The amateur must compare them with the results of his own experience and so gradually acquire the necessary working knowledge.

City streets, or well-lighted squares, at night provide attractive subjects for the night photographer. If a recent shower of rain has left the streets wet, still more attractive effects can be secured. With the lens set to f.2.8, 1-20th sec., will usually prove sufficient, provided no dark masses are introduced in the foreground of the picture. At f.3.5, 1-10th sec. would be required. As a longer exposure does no harm, however, the wisest plan is often to give the longest exposure possible with the camera in the hand. 1-5th sec. *can* be given without any trace of camera shake by an experienced

worker. It is advisable to practise these slow speeds, gripping the camera firmly and holding one's breath as the shutter is released, until the necessary experience has been acquired.

For badly lighted subjects a time exposure is often required. A telescopic tripod is therefore a valuable accessory for the night photographer. It is wise, too, always to use a lens hood for night "snaps" to prevent stray light from striking the lens and spoiling the picture. And always use "backed" films or plates.

Indoor photography by the ordinary room lighting presents a difficult problem. It all depends on the strength of the lighting, the degree of detail required in the subject, etc. A prize-winning picture in a recent Indian night photography competition was secured with an exposure of 1 sec., at f.4.5. The only lighting was a tiny oil lamp, yet the effect was most successful.

For subjects including detail, however, in normal interior lighting, $\frac{1}{2}$ sec. at f.2.8 will probably not be too much. Oil lamp illumination will require considerably more. Try to picture the exact result you require and decide your exposure accordingly. Subsequent comparison of the effect you wanted and the effect you actually got will teach you far more than any amount of theory.

With the ultra-rapid lenses now fitted to miniature cameras, theatre pictures can be taken by the ordinary stage lighting. Any amateur with a camera fitted with a lens of f.2.8 or larger aperture can tackle such work with every prospect of success. It is difficult to lay down hard and fast rules for exposure but with normal stage illumination 1-10th to 1-20th sec. on super "pan" film will often secure a well-exposed negative. Simi-

larly, at public dinners, dances and other night functions it is possible to secure interesting and attractive "snaps." In India, such pictures would be novel enough to attract a good deal of attention and might prove profitable from the press and commercial points of view.

Lightning photography is of particular interest in this country. Many fine night pictures are awaiting the Indian amateur who gets busy with his camera during a thunderstorm. The method of securing the correct exposure for lightning pictures is very simple. Set the camera on a tripod facing in the direction of the storm. Stop down the lens to f. 16 or 22 and open the shutter. Await a vivid flash of forked lightning, then close it again. Lesser flashes, occurring before the main flash, can be disregarded. Remember, by the way, to include the horizon in your viewing angle as this yields a more effective setting for your picture.

Firework displays also provide attractive material for the night photographer. The method employed to secure effective firework pictures is to leave the lens open sufficiently long to allow a succession of fireworks to be registered on the plate. A single bursting rocket, for instance, although presenting a striking spectacle to the eye, would not be sufficient material for a whole picture. It would be necessary to leave the lens open while a dozen or so rockets were let off. The camera must, of course, be set firmly on a tripod, and panchromatic films or plates should certainly be used.

Night negatives require careful treatment during development. Aim at softness. Dilute your developer more than usual and give a correspondingly longer time in the developing bath. Be particularly

careful to avoid scratches which will show up much more than with daytime pictures. Whenever possible, print or enlarge on a rough surface paper, like Kodak "Royal."

In India, again, there are fine opportunities for novel night pictures. When planning out pictures of this type, it is as well to remember the changes that are taking place in pictorial representation. New angle photographs have a charm that seems to harmonise well with the vigour of modern life. Although new angle viewpoints can be profitably exploited in daytime pictures, night photography is a particularly successful medium for the expression of this new idea.

What exactly is a "new-angle" photograph? One or two examples will make this clear. Instead of "snapping" a homeward bound liner from the quay, the new angle photographer would probably point his camera down from the deck on the cheerful stream of passengers mounting the gangway. He would rely upon the expressions of the passengers to convey the effect "Homeward Bound." Taken at night, this should make a particularly fine picture.

Or let us suppose we wanted a photograph, "In the Indian Bazaar." We would take care to avoid any general viewpoint that would give nothing but a picture postcard result and would concentrate on discovering some little intimate scene that concisely conveyed our basic idea. A close-up of a buyer haggling over a purchase, taken at an oblique, yet natural and pleasing angle, would be the type of picture to aim at.

Inexperienced photographers sometimes imagine that all one has to do in new angle work is to point the

camera at an extraordinary angle at any subject and press the trigger. There is far more than this in new angle pictorialism.

In fact, in judging a photograph of this type, we have to consider composition, pattern and motif, just as when judging any other picture.

Freak effects are best avoided; they are rarely successful. Always be on the look out for novel viewpoints that can be made to express a definite idea. Try to give the world a novel glimpse of life in India as it really is.

CHAPTER IX.

FOR THE ADVANCED AMATEUR.

In these days of intense competition a telephoto lens, to interchange with the lens normally used, becomes a necessity for those of us who aspire to the best results. The modern tele-lens, with its relatively large aperture and splendid defining qualities, has revolutionised certain classes of photographic work.

At sports meetings, when it is impossible to get near to the performers, a tele-lens is often essential if a good picture is to be secured. Very many of the best sports photographs appearing in the papers could never have been obtained with a lens of normal focal length. This also applies to many animal and bird photographs.

In pictorial work tele-lenses are equally useful. It is very often impossible to select a near view-point that enables a pleasing scene to be represented to best advantage. By fitting a tele-lens we can choose a more distant view-point and still get the same-sized picture on the plate.

In portraiture, and other close-up work, a telephoto lens is also of great assistance. Not only does the small depth of focus given by a tele-lens result in fine, smooth backgrounds, but an exaggerated perspective is avoided. It is for this reason that a tele-lens is often used for architectural photography in preference to a lens of normal focal length.

The principles upon which a tele-lens works are not difficult to grasp. All lenses, whether single glasses

or a complicated arrangement of many component glasses, can be classified as either positive or negative. A positive lens, such as is used for the normal lens of a camera, will give a reduced image of an object on a piece of ground glass placed at a suitable distance from it. A negative lens will give no such image and its function behind the positive lens in the telephoto system is to increase the size of the image. This it does by spreading the light passed by the positive lens over a larger area. The focal length of the positive lens is therefore increased without necessitating a greater camera extension to bring the image into focus.

The degree of magnification given by a tele-lens may be said to be governed by the relation between the focal length of the telephoto combination and the focal length of the normal lens fitted to the camera. Thus an 11-inch telephoto lens interchanging with a $5\frac{1}{2}$ -inch lens on a $\frac{1}{4}$ -plate camera will give 2 linear magnifications, or 4 times increase in area.

This means that the photographer can be twice the distance away from his object and yet secure the same-sized picture. Or, if he takes his picture from the same view-point, then the object will be twice as large. A 22-inch tele-lens on the same camera would give 4 linear magnifications, and so on.

Modern tele-lenses can be divided into two categories. The most useful for all-round amateur work are the "fixed-separation", telephoto lenses, manufactured in various focal lengths to suit all sizes of camera and fitted with suitable flanges to make them interchangeable with the normal lens in use. These tele-lenses are of relatively large aperture—f.7 7, f.6.3, f.5.6 or even f.4.5—and can therefore be used for fast sports

work. They give a fixed degree of magnification and are particularly suited for use with the various makes and types of reflex and folding focal-plane cameras.

Considering their great usefulness they are not expensive. For instance, an 11-inch f.5.6 tele-lens (which is quite fast enough for all amateur work) for a $\frac{1}{4}$ -plate reflex, giving two magnifications can be bought for £13 in England. Two magnifications is quite enough for most amateurs. For smaller cameras the price is less. A famous make of f.4.5. tele-lens, suitable for use with a V.P. size focal-plane camera, costs only £9.

While a camera fitted with a focal-plane shutter facilitates the interchanging of the lenses, the amateur with a good class camera with a between lens shutter can also have the benefit of telephoto equipment. Tele-lenses to screw into the front of the camera, after the front and back components of the normal lens have been removed, are now on the market.

A very efficient lens of this type can be bought for suitable $3\frac{1}{4}$ by $2\frac{1}{4}$ inch folding hand cameras at an English price of five guineas. For certain makes of cine-film or V.P. miniature cameras, tele, or other types of long focus, lenses are available in various focal lengths. The keen amateur in India will be well-advised to take his camera to any of the well-known photographic firms to ascertain whether a tele-lens can be fitted and what the cost of it would be.

For greater magnifications than are possible with "fixed-separation" tele-lenses on the majority of cameras telephoto lenses of the adjustable type are often the means of securing fine pictures of distant mountain peaks, inaccessible architectural features and similar actionless subjects. These lenses are restricted in

their use to cameras with a focussing screen. They are adjustable in that they are capable of being used on any size camera, the focal length of the telephoto lens depending upon the camera extension at which it is used.

On a $\frac{1}{4}$ -plate camera an adjustable telephoto lens can be fitted to give as much as six linear magnifications, or 36 times increase in area. But the greater the magnification the slower the lens becomes. For instance, when set to give six linear magnifications on a $\frac{1}{4}$ -plate camera, a normal lens of this type would have a relative aperture of about f.25. A time exposure would then be required for very many subjects. Adjustable type tele-lenses are comparatively inexpensive. One well-known English lens (the Dallmeyer "Adon", for which Messrs. Baird and Tatlock are the agents in India) is priced at £7 and can be strongly recommended for distant landscape work in India.

There are one or two points that are of special importance in telephotography. The camera must be either held rock-steady in the hand or, better still, set on a solid tripod, while the exposures are being given. Imperfect definition due to camera vibration is far more likely to occur in telephotography. Special precautions to avoid vibration and movement will ensure that the fullest advantage is taken of the splendid defining qualities of modern telephoto lenses.

A lens hood should always be used on a tele-lens, and, whenever possible, a colour filter is a wise precaution. It is also necessary to mask the finder of the camera so that the reduced field of view given by the tele-lens is clearly shown. With wire-frame finders a metal mask can be slipped over the front frame. With a "brilliant"

finder a similar result can be obtained by fixing a little mask on the top of the finder. A suitable mask can usually be obtained with the telephoto lens for a small extra charge.

Nature photography and wild animal work in India offers limitless opportunities to the enthusiastic amateur. Jungle photography of dangerous animals is, it is true, a job for the specialist, demanding special apparatus and an operator of considerable experience and skill. Few amateurs can venture into this field. But there are nevertheless numerous less ambitious wild-life subjects that will yield striking pictures. A good series of Indian bird pictures, for instance, would not only be of great pictorial interest but might easily prove to be a valuable contribution to the study of bird life in this country.

Similarly, a photographer might specialise in snakes and their habits. A fine series of nature photographs could be built up on these lines. Or the smaller wild animals, such as the mongoose, jungle cats and squirrels, etc., would provide fine opportunities for the amateur, clever enough, and patient enough, to photograph them in their natural haunts. Butterflies and various other insects also provide opportunities for the keen photographer-naturalist. A friend of the writer's has a splendid collection of Ceylon lizard photographs. They are both interesting and instructive, and throw much light upon the habits of these little creatures.

For natural history photography a tele-lens will often be found to be indispensable. With an aperture of f.6.3 or better, instantaneous exposures can be given even in strongly shaded surroundings. A silent shutter is also necessary. If the shutter fitted to the

camera does not comply with this condition, the naturalist photographer will be well-advised to buy a special shutter to be fitted on the front of the tele-lens. A suitable shutter of this type, the "Luc" shutter, catalogued by the well-known English firm of Dallmeyer (Indian agents Messrs Baird and Tatlock) costs only two or three pounds according to the size required.

Thus equipped, the amateur photographer can make his debut as a camera-naturalist. Patience, a knowledge of the creatures he wants to photograph and the ability to take advantage of sudden opportunities are, he will find, indispensable to success. Further than this, he will be obliged to rely on his own ingenuity and skill. Experience alone can teach him the working details of any particular branch of natural history work.

Colour photography is a most fascinating branch of work. Several methods are now in use to produce pictures in natural colours by the use of special filters, plates and films, and research is continually going on in this field. The great flaw in colour photography at present is that colour prints on paper cannot be made from the negatives. Newspapers can produce colour pictures. The photographer, however, has to be content with transforming his negative into a colour positive, and viewing the transparency by holding it up to the light, or by projection.

Colour photography can be pursued in India thanks to Messrs. Agfa Photo. Co., of Calcutta, Delhi and Madras, who market the well-known Agfa actual-colour roll films and plates in this country. These films and plates are quite easy to handle and good results can be obtained straight away by the experienced amateur. A special filter has to be used in conjunction

with the plates, and this also can be obtained from Messrs. Agfa Photo. Co. The "Agfacolour Viewing Apparatus," catalogued by this firm, is also a most useful instrument for obtaining the full effect of the finished transparencies.

"Agfacolour" films and plates are obtainable for many different sizes of camera, from the little ciné film miniature, like the "Leica" or "Contax", to $\frac{1}{4}$ -plate and larger instruments. A fast lens is an advantage for colour photography; it is, in fact, essential for subjects containing movement. "Agfacolour" film, with the necessary filter, is comparatively slow—approximately thirty times as much exposure is required as when using an emulsion of 500 H. and D. This means that, for a fairly open landscape in India, for example, when an exposure of 1-150th sec. would often be sufficient at f.6.3, 1-5th sec. would have to be given for "Agfacolour." This would necessitate the use of a tripod and would not permit action to be included. Because of the long exposure required, action colour pictures are at present only obtainable with a lens working at f.2.9 or larger aperture, though developments to increase the speed of colour plates are already occurring.

It will be realised from the foregoing that normal exposure presents few difficulties. Decide what exposure you would give for extra rapid film and then give approximately thirty times as long. Development is also quite a simple process once the essentials have been grasped. Develop with a green safelight, or in darkness. What has to be done is to develop the negative and then convert it into a positive. These are two distinct processes. Messrs. Agfa market

special solutions for their colour plates and films, and the amateur can do no better than use them according to the instructions enclosed by the makers.

The wonderful opportunities in India that await the clever colour worker hardly need stressing. Our sunsets and sunrises alone provide marvellous material. Then there are so many everyday scenes that always lose so much when reproduced in monochrome. From the photographer's point of view India might well be described as "the land of colour." Landscapes, street scenes, gardens—almost every subject you can think of—cannot fail to profit by reproduction in natural colours.

Viewing colour positives by projection is, of course, by far the best method. The magnified image, thrown upon the screen, enables the full charm of colour photography to be readily appreciated. Many of the leading photo. firms in India sell suitable projectors and, for those who can afford the initial outlay, such apparatus is well worth buying. It is especially valuable for schools, colleges, etc., where illustrated lectures can then be given.

With such equipment, it is not necessary to confine one's activities to colour transparencies. Slides can be made from monochrome negatives and shown on the screen. This opens up a vast field of educational possibilities. In the future, photography is likely to play an increasing part in education. While, for the advanced amateur, there is no more satisfactory method of showing his pictures to an audience of friends than by means of projection.

The long list of supplementary equipment obtainable for high grade precision cameras includes projectors in various sizes. Original $1\frac{1}{2}$ by 1 inch "Leica" or Contax" pictures can be shown on the screen. All that has to be done is to print from the negative film strip on to positive film. A special printing frame can be bought to facilitate this work. The Agents in India for "Leica" and "Contax" will give full particulars on application.

For other camera owners slide-making is just as simple an operation. All the leading film and plate manufacturers market special lantern plates and several excellent makes are available in this country. The usual size of such plates is $3\frac{1}{4}$ by $3\frac{1}{4}$ ins., convenient dimensions for projection. In the case of negative plates or films approximating to these proportions, the process of printing can be done by contact, just as when printing on paper, gaslight or bromide. The ordinary printing frame can be used and a suitable exposure given. The exposure depends, of course, on the particular brand of lantern plate used and must be discovered by trial. Development is then proceeded with according to the instructions enclosed with the lantern plates.

For larger or smaller negative sizes, the printing on lantern plates has to be done with an enlarger, in the first case the image has to be reduced, in the second enlarged. Again the process is exactly similar to projection printing on paper. Development, fixing and washing follow as with contact printing.

After the lantern plates have been dried it is usual to mount them between cover-glasses of the same dimensions and mask them with special black binding

paper, sold for this purpose. The plates will then be preserved in good condition for a long period and there is no fear of scratches, etc., when repeatedly showing them in the projector. For the same reasons, it is advisable to mount glass or film colour positives between cover plates in the same way.

Stereo photography is another fascinating sideline. Each of the human eyes sees a subject from a slightly different viewpoint. The brain combines these two images to produce an effect of reality. Near objects stand out from the background; there is an effect of solidity, as can immediately be realised if we close one eye and notice how much less "real" our vision becomes. The principle of stereoscopic photography is to produce the same effect of solidity and reality.

This is done by taking two pictures of the subject from slightly different viewpoints, about 3 inches apart, in accordance with what our eyes do automatically. These two pictures, although practically similar, differ slightly in viewpoint; when examined through the stereoscope, exactly the same effect is produced as when we see a scene in Nature.

For certain miniature cameras special stereo equipment is available. There is, for instance, the "Stereoly" attachment for the "Leica" by means of which two pictures are obtainable in the $1\frac{1}{2}$ by 1 inch frame. Messrs. Leitz, the makers of the "Leica", also market a neat little "Stereo Viewing Apparatus" through which the resultant positives can be examined.

Special cameras for stereo work are also available. They vary in price from about Rs. 21 for the simple beginner's 'Stereoscopic Puck Camera', sold in India

by Messrs. Houghton Butcher, to Rs. 150 for several of the Ihagee models (Indian Agents: Messrs. Mangalbhoy & Co.) and Rs. 500 approx. for the Voigtlander "Stereoflectoscope" (Messrs. Schering-Kahlbaum (India), Ltd.) and the Franke and Heidecke "Heidoscop" (Messrs. Agfa Photo. Co.)

All these cameras are, needless to say, beautifully constructed and the twin lenses are so arranged that stereo pictures are obtained automatically. The amateur in India, who is keen to take up a comparatively novel branch of photography, could not do better than devote his attention to stereo work. Many Indian scenes can only be fully appreciated when viewed as actually seen by the eye

Developing and printing of stereo pictures requires no special care. Later, the prints have to be mounted for viewing in the stereoscope. This, too, is a simple commonsense process.

It often happens that amateur photographers want to copy printed illustrations, manuscripts, or other printed or written matter. Sometimes profitable commissions can be obtained to execute such work. A few hints on copying should therefore be given here.

Any camera, however simple in construction or cheap in price, can be used for copying, provided, of course, that it will permit, by means of supplementary lenses, double extension or otherwise, of focussing sharply on very near objects. Copying can be done quite successfully by daylight provided care is taken to secure even illumination all over the subject to be copied. Professional copying is actually done as a rule by artificial light, because the fixed intensity of

the illumination enables more regular results to be obtained. Nevertheless, as has been pointed out, artificial light is by no means essential.

The time of exposure depends entirely upon the strength of the light and the speed of the plate. A slow plate of the "photo-mechanical" or "process" type specially prepared by all the leading manufacturers for this work, should certainly be used. Such plates usually have a speed of about 50 H. & D. As a rough guide to the length of exposure required to copy, say, one of the pages in this book, using a slow "photo-mechanical" plate, indoors in a bright room, facing the window, at 8 p.m. in India, strong sun outside, using stop f.16, 10 secs. would probably be about correct.

Film users can secure quite good results with ordinary film such as Kodak "Regular", while for miniature ciné film camera owners either positive ciné stock or the slower grades of fine grain film are advised.

Development presents few difficulties provided exposure has been approximately correct. Should, however, the plate have been over-exposed, remove from the developing bath as soon as any suggestion of deposit begins to form in the clear lines of the negative that represent the blacks of the subsequent print. This is important as otherwise sufficient contrast will not be obtained in the print. Intensification can always be relied upon to strengthen the deposit and thus secure clean "whites."

For the "Leica" and "Contax" special copying apparatus is available and this simplifies the process to a great extent. For those, whose work or hobbies invite much photographic copying, these little cameras

with copying accessories are ideal. Cost of film material is kept down to a minimum, yet results are just as sure as with larger cameras.

Finally, there is infra-red photography, an innovation that is again of particular interest in India. Several remarkably fine infra-red photographs of distant panoramas have recently been reproduced in Indian newspapers. When we think of the tremendous distances over which the eye can sometimes range in India we can appreciate the particular value of this new branch of work.

The basic principles of infra-red photography should be briefly explained. As is well-known, light is made up of various coloured components which, under certain circumstances, can be split up to form the spectrum. In Nature, the spectrum is seen as a rainbow. At one end of the spectrum are the violet rays, at the other the red. Beyond the violet are the invisible ultra-violet rays widely used today for the prevention and treatment of disease; beyond the red are the also invisible infra-red rays, the heat rays. These rays of light possess the property of being affected less by moisture and particles in the atmosphere than any other rays in the spectrum. It follows, therefore, that if we can make use of these invisible infra-red rays for photographic purposes we shall be able to secure a better rendering of distant scenes.

The discovery of a new dye which makes the plate sensitive to infra-red rays enables us to do this. These plates must be used with a special infra-red filter: they are, in fact, useless without it for daylight work. It must be remembered, however, that the use of the filter alters the focus of the lens. Photographic lenses

are not usually corrected for red light. As infra-red light is invisible to the eye it is not possible to focus correctly by examination of the focussing screen. Either the camera must be specially scaled for infra-red work or (and this is the more practical method for amateurs) focussing must be done with a red filter, such as the Ilford "Tricolour Red", on the lens when visual focussing will enable us to obtain approximately correct results

Infra-red plates are comparatively slow. Quite lengthy time exposures will often be required. With the necessary infra-red filter on the lens these plates can be rated at about 10 H. & D. to daylight. This means that for a distant landscape at 8 a.m. in India, full sunshine, f.8. stop, 4 secs. would probably be required. The reader will, however, have learned by now that it is really impossible to lay down arbitrary rules on such a complex subject as exposure. The above must, therefore, only be taken as a basis for individual experiment.

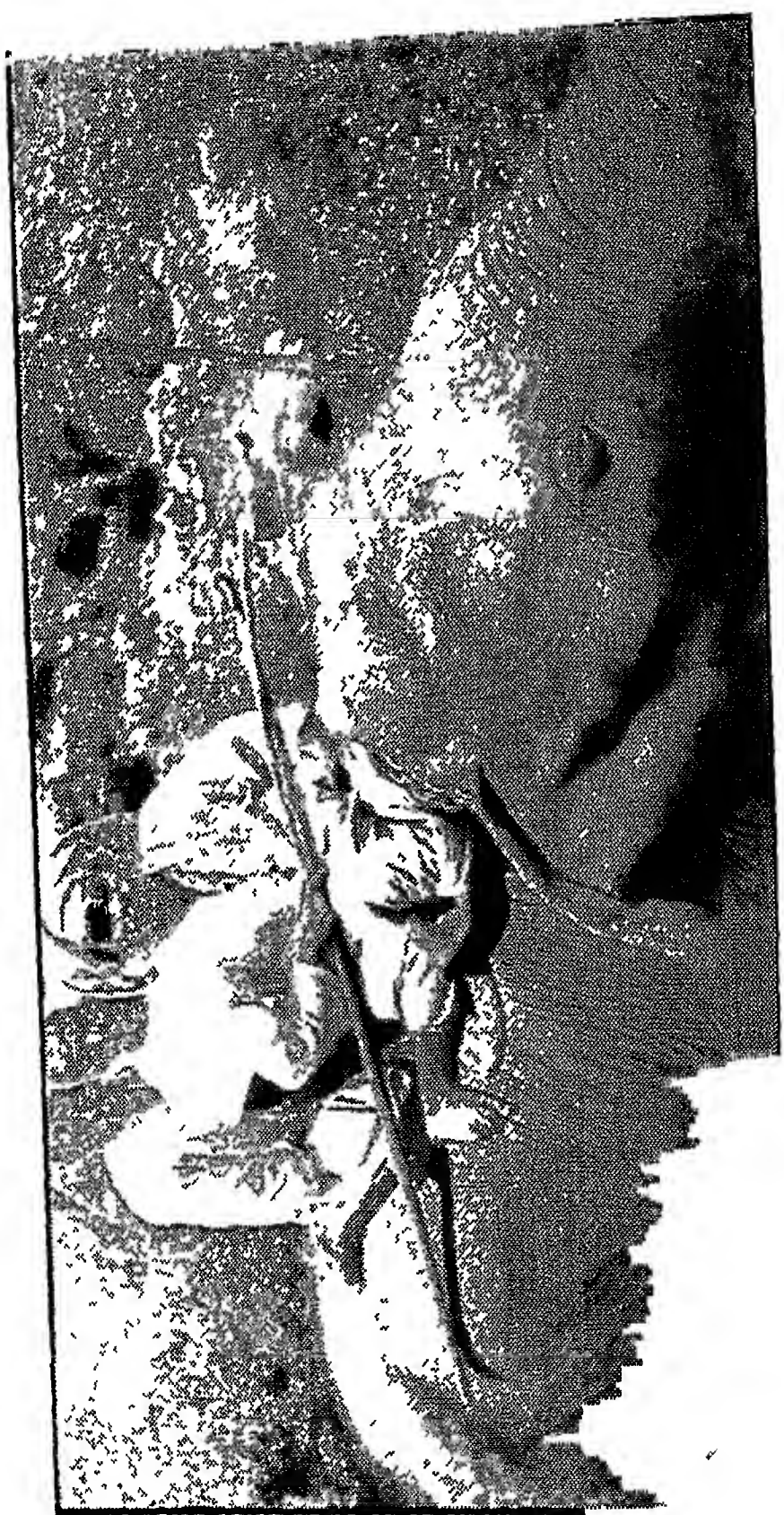
Development of infra-red plates is just the same as when working with panchromatic material. Total darkness is advised, although a green light of suitable colour and strength can be used. With regard to printing and enlarging no departure from the normal procedure is required.

In India Messrs Agfa Photo. Co. market the Agfa series of infra-red plates in various sizes. Filters can also be obtained from them. There are also the well-known range of Ilford infra-red plates and filters, particulars regarding which can be obtained from the Agents for India, Messrs. Houghton, Butcher (Eastern)

Ltd. Do not keep these plates for long before use; fresh infra-red material is essential for the best results.

Infra-red light has a curious effect upon certain features in a landscape scene. This will have been noticed immediately by any student of infra-red newspaper pictures. Trees, and other vegetation, appear white in the print. This is due to the fact that such features give strong reflections of the infra-red rays. In scientific work this differentiation between certain materials is often of great value.

It is, however, with the application of infra-red photography to long distance work in India that the majority of amateurs are concerned. We have stressed the great opportunities that exist. It remains for enterprising amateurs in this country to exploit them to the full.





"THE IMMUTABLE ORIENT" Taken with a Zeiss "Tessar" lens "The expert photographer will often rely upon simplicity for the representation of his basic idea."
(Photo by H. Mahulian. reproduced by courtesy of Messrs. Carl Zeiss.)

CHAPTER X.

CINEMATOGRAPHY.

Amateur cinematography really dates from the introduction of 16 mm. film in 1923. Since then enormous growth has taken place and there are now not only large numbers of individual amateur ciné enthusiasts but also well-organised societies in England and elsewhere.

These amateur societies produce and take their own films, and are doing some very fine work. This is an idea that is capable of development in India. Ciné societies, organised in various parts of the country, would be able to attract many amateur photographers to their ranks for the purpose of exploiting the exceptional opportunities that exist in India for striking ciné subjects.

It is with ciné subjects and treatment that we will deal here. For technical information with regard to the various designs of ciné camera now on the market the reader is referred to one of the many English text-books dealing with the subject. The experienced "still" photographer will find no difficulty in mastering the technical side of amateur ciné work.

A word on the cost of amateur cinematography, is, however, required. The tendency is for the prices of cameras, films and projectors to be constantly reduced. Messrs. Kodak, Ltd., with their Cine Kodak "Eight", Messrs. Zeiss Ikon, Messrs. Agfa, Messrs. Pathé and others have given this question of expense their most

careful attention. It is possible now to buy a first-class ciné camera for Rs. 150. A fully efficient projector will cost about the same. A roll of Cine Kodak "Eight" film, sufficient for 25 average "shots", costs only Rs. 8, including developing and finishing. Messrs. Agfa's excellent 16 mm. film, sold in 50ft. and 100 ft. rolls, is also most reasonably priced. The same applies to other makes of ciné film sold in India. In fact, contrary to the popular belief, amateur cinematography is no longer confined to those to whom expense is not of primary importance.

Let us take the case of an amateur photographer in India who has decided to go in for ciné work. He has bought his ciné camera and has taken the trouble to master its technical capabilities. What subjects is he going to "shoot"?

Here we are confronted with the fundamental requirements for success in amateur cinematography. *He has got to find subjects that cannot be adequately portrayed in still pictures.* This would seem to be obvious, yet there is a surprising number of amateur ciné workers who fail to recognise its universal application. They will expose a length of film on a landscape scene without realising that a single still picture would have given as true a representation of the scene before the camera. Ciné film is too valuable to be wasted on still subjects unless those subjects are essential to give full effect to a wider succession of ideas.

This will be explained later but for the present we can say that movement is essential in a ciné subject. And it must be movement of a natural and effective type. To persuade relatives and friends to grin self-consciously before the camera, or to go through simple

everyday actions that are of no interest to anybody, is an elementary stage in the amateur cinematographer's education that can well be omitted.

This does not mean that there are no subjects of a personal nature that are worth recording by the ciné-camera. There are fleeting scenes in family life that are sufficiently attractive to interest outsiders when they are represented on the screen. This is a good test for a prospective subject. Will it interest anybody beyond the amateur's family and friends? If it will not, then it is not really worth the strip of celluloid on which it will be taken.

The beginner in cinematography may retort by saying that as he has bought his camera purely for his own amusement he is not concerned with interesting other people. That is all very well as far as it goes. But if he works on that principle he will inevitably find that his productions soon cease even to interest himself. Once the novelty has worn off he will find himself wondering why his films are so tame.

Granted, then, that the guiding principle of ciné work is to discover suitable subjects of universal interest, how is the amateur to set to work to secure them? The answer is—planning. In previous chapters, the necessity for planning out subjects has been stressed. This preliminary work is of even greater importance in ciné work if costs of film material are to be kept within reasonable bounds.

Before the amateur even gets out his ciné-camera he should have got his plan of action down on paper. He should have a definite purpose before him and it should be crystallised in brief scenario form. Only in

this way can be sure of avoiding wastage of film on casual "shots."

For instance, let us suppose we want to make a short film of the baby, aged six months. This is a very popular type of personal ciné subject; it is naturally of tremendous interest to parents to keep a living record of the various stages of their children's growth. Yet it is by no means an easy subject for the ciné-camera. Treatment is going to make all the difference to its worth as a pictorial record.

We set to work to plan our scenario. It works out something like this.

Shot 1.—Close-up, Baby's bottle being filled from jug, 10 sec.,

Shot 2.—Close-up, back of pram, vibrating with Baby's hunger howl, 6 sec.;

Shot 3.—Close-up, Baby howling, 10 sec.;

Shot 4.—Medium close-up, ayah bringing bottle and bending over pram, 15 sec.;

Shot 5.—Medium close-up, Baby on ayah's knee, taking his bottle, 15 sec.;

Shot 6.—Close-up, bottle nearly empty, 6 sec.;

Shot 7.—Close-up, bottle finished, Baby's seraphic smile of contentment, 10 sec.

This, admittedly, is rather too much like an advertisement for some patent baby food but we must not expect too much to begin with. Working on these lines, we do at least get a little human interest story that is worth far more than casual and unconnected "shots." Always build your incidents together so that they form a story. It is not essential, of course, to do all the "shooting" at one time. In fact, one often has to wait for just the right "shot" to fit into the story.

Once this idea of building up a story has been properly grasped, there is not a single suitable ciné subject that cannot be treated in this way. Here is another test for ciné subjects. *Can a story be built up and adequately portrayed in a reasonable number of "shots" ?*

Let us analyse one or two Indian subjects from this point of view. Suppose we want a film recording the attractions of the garden. We have got to be careful here. We have got to plan the picture very minutely if we want to produce anything of merit.

We start off with several distant "shots" giving a general view of the whole garden. We have moving human figures in each "shot." Then we begin to search for details, things going on "below the surface," little incidents that we don't often notice. Bees operating on the cannas, lizards catching flies, a butterfly settling on a bush, etc. We might introduce a humorous touch with a "shot" of the garden cooly when he thought no one was watching him ! In this way we should build up a little story of connected incidents.

Or, suppose we were more ambitious, and hit on the idea of an Indian Horse Show picture. There will be many attractive opportunities at the "jumps" and elsewhere. We must try and link them together into a connected whole.

One "jump," perhaps, is particularly promising. But we don't confine ourselves to "shooting" the horses as they come over in quick succession. That would be lacking in suspense interest. We first of all "shoot" one or two of the horses being saddled and mounted. Then we move along and take a close-up of the "jump." Subsequent "shots" show the horses coming over,

while we shall also move a little way down the course and take a few "shots" of the horses approaching the "jump."

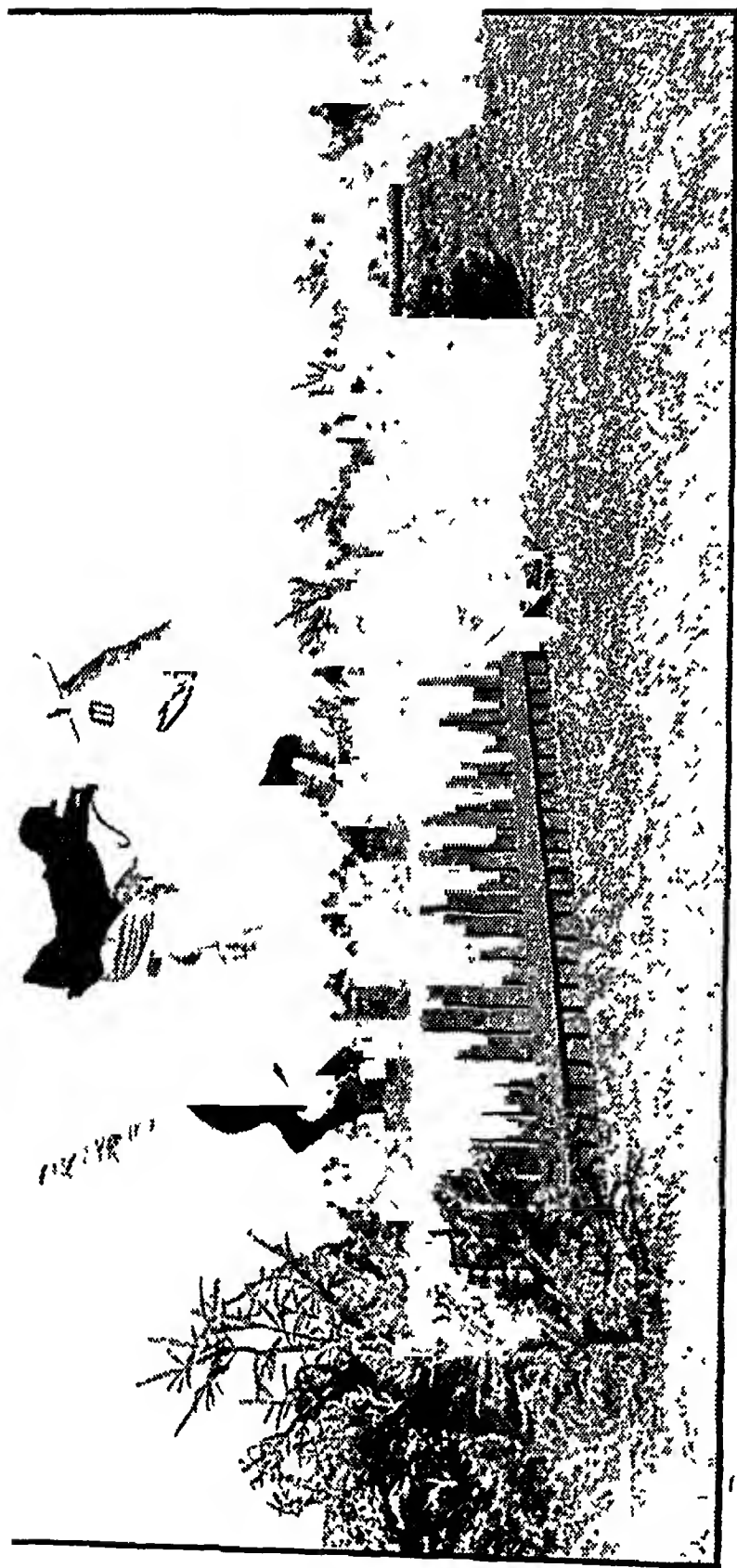
Then comes the job of editing our picture. It will finally be something like this Shots 1 and 2.—Horses being saddled; Shots 2 and 3.—Horses being mounted and ridden off; Shot 4.—Approaching the "jump"; Shot 5.—Close-up of "jump"; Shot 6.—Horses still approaching; Shot 7.—Close-up of "jump" again; Shot 8, "up and over." By means of flashing back a couple of times to the close-up "still" of the "jump", suspense interest is well maintained until we reach the climax.

This is how still subjects can be used to link up incidents and preserve interest in the picture as a whole. Once this idea is understood amateur cinematographers will have no difficulty in employing it in various situations as occasion demands

There are various other ways in which a still subject can be rendered suitable for the ciné-camera. Suppose, for instance, that we wanted to take some ciné views of Bombay. By operating from a moving car it would be possible to secure striking effects. By drawing on his ingenuity, the successful ciné worker is able to create opportunities for his camera.

* * *

Ciné subjects are so plentiful in India that it is safe to say that there is hardly a single aspect of Indian life that will not make a fascinating movie if treated in the right way. It is treatment that makes all the difference between success and failure. And it is because treatment allows such full scope for a ciné worker's individuality and creative ability that amateur cinematography is such a fascinating hobby.



"UP! OVER!" Taken with a f 4.5 Zeiss "Tessar" lens, exposure, 1/250 sec Anticipation is the secret of success in sports photography (Photo, by F Esch, reproduced by courtesy of Messrs Carl Zeiss)



"HIGH JUMP" Taken with a Zeiss "Biotessar" lens, at full aperture of $f\ 2.8$, exposure, $1/500$ sec
(Reproduced by courtesy of Messrs Carl Zeiss)

CHAPTER XI.

COMPETITIONS

Amateur snapshot competitions are increasing in popularity. Besides the competitions run by newspapers and magazines, many commercial firms have introduced this idea into their advertising programmes. There are tempting cash prizes awaiting the amateur who consistently submits the right type of prints.

What is the right type of "snap" for competitions? Theoretically, that is an easy enough question to answer. Put yourself in the judge's place. Imagine yourself examining thousands of snapshots. What are the qualities that are going to make you pick out a print and say . " Now this looks promising " ?

Novelty. This is the first and most important point. Originality of subject or treatment will always command attention. Originality of subject is best, because, provided the subject reaches a sufficiently high standard of novelty, little skill is required in its presentation. All that has to be done is to produce a good, clean print that shows off the novelty of the subject to the best advantage

Even the most hackneyed subject can be made to appear novel provided it is treated in an original and striking way. The difficulty is to find a method of presentation that has not been used thousands of times before. It *can* be done as study of prize-winning pictures proves, but it is by no means easy. The less

experienced amateur stands a far greater chance of success in competitions if he will concentrate on finding subjects that are novel in themselves.

Newspapers describe an article, or a photograph, as "topical" if it deals with a subject that is of special interest at any particular time. This is a factor affecting novelty. While a subject may not be novel of itself, presentation at just the right moment may make it so. For instance, suppose a big religious festival is taking place at a certain Indian city, then a good "snap" of a scene in that city will immediately take on the semblance of originality. People will have their interest temporarily focussed on the place where they know important ceremonies are being performed.

Other subjects are of special interest at various times of the year. They may be described as possessing seasonal topicality. For example, a picture of a night scene after rain, with the lights reflected on the wet city streets, would be more appealing during the monsoon than in the hot weather.

This, therefore, is a point well worth considering when choosing subjects for competition pictures.

Interest. This is the acid test of any particular picture from the prize-winning point of view. It may, or may not, be novel. It may, or may not, be topical, but to stand any chance of a prize it must be of genuine interest to a very large number of other people. The majority of competition winners are reproduced somewhere in print. No newspaper editor, or advertising manager, is going to give space to a picture that does not possess wide appeal. It follows, therefore, that the prizes usually go to the entries that will interest the largest proportion of the general public.

Interest may be aroused in various ways. A photograph may make us smile; it may appeal to our artistic senses; it may supply us with arresting information.

A picture that arouses the first kind of interest is most sought after by the majority of competition judges all over the world. A "snap," containing sufficient human interest to make people smile, is always the safest type of picture to submit to popular competitions.

These "human interest" pictures, however, are by no means easy to compose and "snap." Child studies are a favourite mode of expressing this idea. The secret is to catch your subject unawares. Give the child something to do and watch for suitable opportunities to produce your camera and take a swift "snap."

Miniature cameras are particularly suitable for these "human interest" snaps. A little instrument like the Ensign "Midget" can always be carried in the pocket and is ready for any picture at any time. Attractive scenes often present themselves at the most unexpected moments "If only I had my camera...." How often do we hear that said? How many striking competition pictures do we lose by leaving our cameras at home? The keen amateur cannot afford to miss picture possibilities. Personally I never go anywhere nowadays without having a camera tucked away in one of my pockets. Miniature cameras are now available at such relatively low prices that it is worth the $\frac{1}{4}$ -plate competition worker's while to buy a miniature as a second string. He will find that it pays never to be without it. Believe me, I speak from experience.

Technique. Although this comes last in importance, that does not mean that technically poor prints can

compete on equal terms with others, printed on suitable paper, with just the right degree of contrast and tone, from well-exposed and well-developed negatives. Possibly a poor print of an outstanding subject might win a prize. But since outstanding subjects only present themselves even to the cleverest worker at rare intervals, the wise amateur spares no pains to see that all the prints he sends to competitions are given the best possible chance of catching the judge's eye. Moreover, as he knows that the prize winners will probably be reproduced in print, he takes the trouble to print them in black and white on glossy paper, not smaller than $3\frac{1}{2}$ by $2\frac{1}{2}$ inches, and with a little more contrast than he would require for his own album.

"That is all very well," readers will remark, "but how am I to judge all these things? How am I going to distinguish between a novel subject and a stale one? How am I going to decide whether a particular 'snap' possesses enough human interest to make people smile?"

Admittedly, assessing the value of his own work from a prize-winning point of view is a difficult problem for the inexperienced competitor. Some of the big prize-winning pictures are pure flukes. The lucky competitor has happened to operate the shutter at exactly the right moment and a fine picture has resulted. But, working on these lines, one might press the trigger a hundred times and yet never get a picture that was even worth submitting as a competition entry.

No, the man who wants to pay for the expenses of his camera out of competition prizes has got to take a great deal more trouble than this. It is encouraging to remember that a big percentage of those who send

prints to competitions have really very little knowledge of what they are about. If they do win a prize it is more luck than judgment.

So the amateur who makes a careful study of the pictures that do win prizes in competitions starts with a very big advantage over his more casual rivals. Study on the right lines will soon teach him how to judge novelty, topicality, human interest, etc., and will enable him to incorporate these qualities in his own pictures.

In order to show how this study should be conducted let us analyse a representative number of the pictures that have recently won prizes or commendations in *The Illustrated Weekly of India's* Weekly Snapshots Competition. We will deal with four weeks prize-winners, 23 pictures in all, taken at random from July and August (1934) issues. We classify them according to subject and treatment as follows. 7 "human interest" pictures, of which 3 are child studies, 2 animal "snaps" and 2 "novel incident" photos. 12 "pictorial" studies, of which 4 are sea or river subjects, 1 still life, 1 bird picture, 1 portrait, 3 sky pictures, 2 architectural subjects; 4 "general interest" "snaps," which consist of 1 view, 1 portrait, 1 genre picture and 1 animal sports "snap."

Naturally it is a little difficult sometimes to decide into which category a picture should be placed. Try to decide what a normal person's reactions would be. Would they smile when they saw a particular picture? If so, it is a "human interest snap". Would they gaze in silent admiration? Then, it's a pictorial study. Would they say "Now that's very interesting"? If

so, it can safely be placed in the "general interest" class.

Our preliminary analysis has taught us quite a lot. For instance, we have reason for thinking that both "human interest" and "pictorial" entries are more likely to be successful than "general interest" pictures. Animal and bird studies, we notice, are much in favour. A sea or sky picture should stand a chance.

Then we devote ourselves to studying the individual pictures. How was a particular effect of novelty secured? Why is that prize picture of a Bombay street scene at night so much more effective than our own attempt at a similar subject? How many of the prize-winners are helped with a touch of topicality? And so on.

It is a good plan to cut out prize-winning pictures, classify them and paste them in a book for future reference. But do not allow study of successful pictures to result in mere imitation. What has to be done is to learn the qualities that go to make a prize-winning picture and then reproduce those qualities in your own pictures, in your own way.

Two competitions to which the attention of amateur photographers in India is particularly directed are:—

Illustrated Weekly of India, P. O. Box 213, Bombay.

Runs a weekly snapshot competition specially for amateurs. Any subject provided it is of Eastern interest. First prize, Rs 15, second prize Rs. 10 and several consolation prizes of albums, fountain pens, etc. Also a monthly competition, for which professional photographers are also eligible, on subjects announced in the paper.

The Amateur Photographer, Dorset House, Stamford St., London, S E. 1, England.

Monthly competition for beginners, interemediate and advanced workers. Rules in the last issue of the preceding month. Small cash prizes. Many Indian amateurs successfully compete. Also special competitions announced from time to time in the magazine. The standard of the entries in all competitions is high and a prize is worth much more than its actual cash value.

In addition, English newspapers, photographic firms and others frequently run competitions with big cash prizes. The first prize is sometimes £100 and £2.2 is often paid for each print published. Details of the competitions are always announced in the *Amateur Photographer* (which every keen amateur in India will find it pays him to take) usually in plenty of time for prints to be submitted from India. An enormous number of entries are received for these big competitions (one English provincial newspaper received 80,000 for a recent competition) and the prizes only go to those who have taken the trouble to send the sort of picture that appeals strongly to the British public. Humour, allied with healthy sentiment, is usually the most promising line to exploit. A touch of topicality helps. Suitable subjects can be found in India by the clever amateur with original ideas

One has got to be always on the alert. One cannot afford to miss opportunities. Here again the miniature camera is invaluable. Its unobtrusiveness is a tremendous advantage. "Human interest" subjects must be natural. Any hint of posing or artificiality

promptly destroys all charm. The other day I happened to come across an attractive glimpse of Indian village life, a mother presiding at the family bathing operations in a stream. I pulled out my camera but not quickly enough. Both the mother and children saw me, and began to pose. What might have been an attractive picture was gone! With a little camera that one can conceal in the hand until the moment of operating, one has a far better chance of avoiding such disappointments.

Then there are captions—the descriptions, or titles, that you have to send with your competition entries. See that your facts are accurate, if you are sending the type of picture that can be classified as “general interest.” Let your caption be brief, and to the point. If you are dealing with “human interest” snapshots, try to get a touch of humour into the title. Make it snappy. Study of published captions will teach you the sort of thing that is wanted.

One final word. The idea of amateur photography competitions for publicity or newspaper interest purposes is being widely exploited at the present time. No one can say how long the craze will last. It may fizzle out in a year or two. It may not. But the keen competition aspirant in India will be well-advised to be on the safe side and to send along prints to all the big competitions now. If he waits to learn more about competition photography he may wait too long. Popular photography competitions may have gone out of fashion by the time he is ready to compete



"THE DEVIL BIRD?" Taken with a f 4.5 Zeiss "Tessar" lens at f 9 Exposure, 1/10 sec
(Photo by H. Fischer, reproduced by courtesy of Messrs. Carl Zeiss)



'MILLY THE MOUSER

A miniature camera "snap" Note the pleasing neutral background secured by using a large lens aperture

CHAPTER XII.

PHOTOGRAPHY FOR PROFIT.

So varied are the requirements of the modern illustrated press that it has been said that practically every photograph can be sold somewhere. This, of course, is an exaggeration. But it is certainly a fact that a market does exist for every well-produced photograph *possessing news value*. Many amateur photographers all over the world add to their income by selling photographs to the press. There is no reason why the keen amateur in India should not do likewise.

News value—that is what newspapers and magazines are willing to pay for. To possess news value a photograph must be capable of interesting a large number of people. As with competition pictures, interest is the basis on which press photographs are judged.

There is, in fact, much similarity between these two classes of pictures. Novelty, topicality, interest, technique—the standards by which a competition entry is judged—are all of great importance in press photography. Yet appreciation of these factors alone will not bring success. The would-be contributor of photographs to the press has also got to develop a “nose for news.”

What is “news” as expressed in press photographs? Well, the pictures in the newspapers every day demonstrate the wide range of subjects that possess news value. The only way for the keen amateur to learn to assess these values is to study the picture pages of

the various publications to which he aspires to contribute until he knows the exact types of photographs that are reproduced.

He will find that the majority of newspaper and magazine pictures can be classified either as "something happening" photographs or as "people in the news." Out of 21 Indian photographs appearing in a recent issue of a well-known Bombay weekly newspaper, 8 were of "something happening" and 10 of "people in the news." These two types of pictures provide by far the most promising material for the press aspirant.

"His Excellency the Viceroy making a speech at a Simla School Speech Day," "Jam Saheb's Birthday Procession," "An incident in a match in the All-Indian Rugger Tournament," "The start of a race at the Ootacamund Hunt Gymkhana"—these are all examples of successful "something happening" news photographs. The description "people in the news" explains itself. Study of the picture pages will soon teach the amateur the type of personality picture that is worth submitting.

There is another restricted type of subject that should always be exploited. It may be described as "freaks of nature." Not long ago a picture of a palm tree with several heads appeared in *The Illustrated Weekly of India*. Sometimes one sees press photographs of a tiger cub playing with a cat, or a giant tomato nearly as big as a football. The amateur should always keep his eyes open for curiosities of this sort and submit prints to all the likely markets.

At first, the would-be press operator will probably find that many of his news pictures are disappointing. Although his subjects may be quite suitable he has

failed to make his exposure at exactly the right moment, or under exactly the right conditions. Whatever the subject may be, there are certain moments or conditions when news interest reaches its peak.

For instance, suppose we set out to get a picture of a well-known political speaker. What we have to do is to wait until he employs a characteristic and a striking gesture. Perhaps, as he gets to his peroration, he will stretch out his arms to his audience in impassioned appeal. This is the moment when the experienced press worker operates his shutter.

For it is the press photographer's job to assess the greatest news value and obtain pictures accordingly. When a good picture has been secured, however, the press aspirant still has to find a market for it. Knowledge of markets is just as important as the ability to take advantage of picture possibilities.

The markets open to the amateur press photographer in this country may be grouped as (1) Indian and (2) Overseas. It is not proposed to deal here with the various markets in India. The would-be contributor of pictures must study all the likely newspapers and magazines published in this country for himself until he knows the type of picture each requires. Without intensive market study he cannot hope to sell more than an occasional chance picture.

In normal circumstances (i.e. unless special arrangements are made with a paper for exclusive reproduction rights) the press operator can sell a photograph to as many publications as he likes. It pays to circulate a good news picture at once to all the likely markets. Wherever you send your prints, see that they are well

printed in black and white on glossy paper, preferably whole-plate and certainly not smaller than half-plate size, unmounted. On the back of each photograph an appropriate caption must be written. Let your captions tell the facts as briefly and attractively as possible. A sheet attached is the best method. Name and address on each print.

Remember that the facts you give in the caption must be accurate. If you are not certain of any point, somebody's correct name, for instance, find it out before you send off your print. If a newspaper publishes incorrect facts, it leads to endless trouble and may end in a libel suit. If you are found to be the culprit, you can be certain that you will never sell another print to the newspaper or magazine concerned. Inaccuracy is an unforgivable sin for the press contributor. Whatever you do be accurate with your facts.

A word on copyright from the photographer's point of view. If you take a photograph the copyright belongs to you and no one can reproduce your picture without permission. The only exception to this is when you take the photographs for someone else and are paid to execute the commission. Under these circumstances the copyright belongs to the person who commissioned you to take the pictures and you will be acting illegally if you sell a print without his permission.

The best Overseas markets for Indian photographs are in England. Just now India is being strongly featured in the English newspapers and any "really striking" news photograph has a good chance of being accepted at the normal rates of payment. As examples of the sort of Indian picture that can be sold in England,

the ambitious amateur should carefully note the following subjects, which were of sufficient English news interest to be accepted by leading London newspapers: "Coolies searching for bodies when a warehouse collapsed in Calcutta"; "Indian Prince's son pouring salt into the Ganges before overseas journey"; "The Viceroy and Vicereine arriving at Calcutta Races"; "Shooting with a Maharajah"—a remarkable picture taken during a tiger shoot, showing the line of elephants, and the tiger advancing towards them.

These representative examples prove that an Indian photograph must be of exceptional interest to find favour in England. Do not send pictures of purely Indian importance. The English market should be reserved for profitable exploitation of exceptional pictures.

Remember that the British Public is really much more interested in events happening in England than in a little-known country thousands of miles away. The average newspaper reader in England knows very little about India. He is only interested in picturesque or startling events happening here. Now if a big earthquake were to occur and an enterprising photographer were to send some striking photographs depicting the scenes of the disaster many of them would be certain to sell well. But—fortunately—big earthquakes don't happen very often. To send pictures of events not of world-wide importance is a waste of time. In the normal course of events the number of opportunities for selling pictures in England will be few and far between. The thing for the ambitious Indian amateur to do is to study the English picture market so carefully that he knows how to exploit to

the fullest advantage any chance that may one day come his way. He can only do this by continually noting the pictures that are reproduced in English newspapers and magazines.

The best thing to do if a really big picture does present itself is to send the negative immediately to a London press agency. The agency will sell the picture to the best advantage, deduct its commission and expenses (usually about 40 per cent of the gross receipts) and remit the balance. For Indian operators this is by far the most profitable selling method to employ.

Reliable London press agencies handling pictures are :—

Photopress, Ltd., 10, Johnson's Court, Fleet St., London, E.C. 4.

Central News, Ltd., 5 New Bridge St., London, E.C.4.

Northern News Services, Ltd., 2 Queen Sq., London, W.C. 1

And many others, particulars of which can be gleaned from any suitable reference book.

The keen amateur, who reads this, must not run away with the idea that he is going to make a lot of money out of supplying pictures to the press. Even the most persevering and competent operator can hardly hope for that. The market for press photographs is so crowded nowadays that it is only a very small percentage of the pictures submitted that ever appear in print. A well-known Bombay weekly newspaper cannot accept even one in a hundred of all the photos. submitted. All the most persevering amateur can reasonably expect is to make a little extra money now and again to pay for his photographic expenses, or to buy himself a more efficient outfit.

Lest this should sound too discouraging, however, it might be mentioned that the biggest press photography *coup* on record was the work of an amateur with a cheap snapshot camera. By a lucky chance he was exposing a plate just at the moment when a bomb was thrown during the wedding procession of the King of Spain. That photograph is said to have brought him no less than £30,000—and it is still selling !

Quite recently an Afghan, pupil of Mr. R. H. Mallinson, 7, Rose Crescent, Cambridge, England (who conducts an excellent tuition service for amateur photographers who aspire to press contribution) earned £20 from his first batch of photographs submitted to English papers. This is, of course, an exceptional case. Yet it proves that opportunities do exist for the clever amateur.

Apart from press photography there are other ways in which the enterprising amateur can add to his income. Home portraiture is quite a promising line for India. Instead of getting clients to a studio, the go-ahead photographer takes his camera to their homes. Parents, who will not take their children to an official photographer, can often be induced to pay the Home photographer a reasonable fee. Miniature cameras, with extreme aperture lenses, are particularly suitable for this branch of commercial work.

The advertising managers of many commercial firms are ready to consider any really striking photographs advertising their products. One of the most famous railway posters in England originated as an amateur snapshot. In this type of work the photographer has to consider the appeal exerted by any particular product and put that appeal into a picture

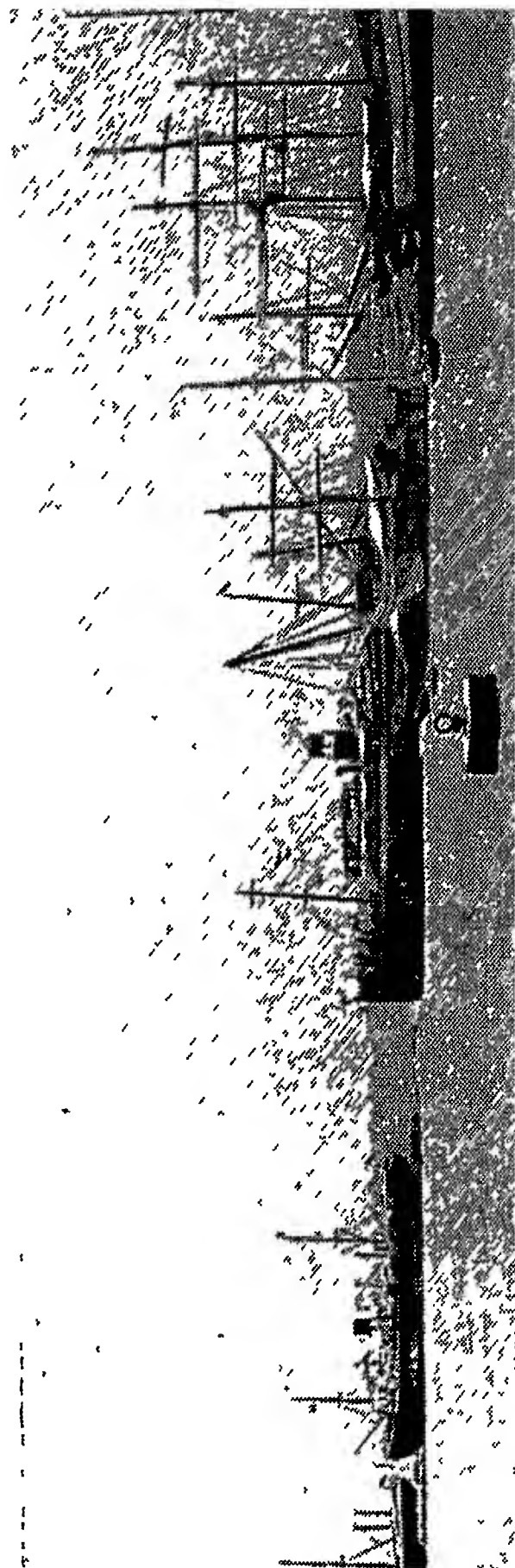
in a novel and striking way. Study of photographs used for advertising purposes will show how this can be done.

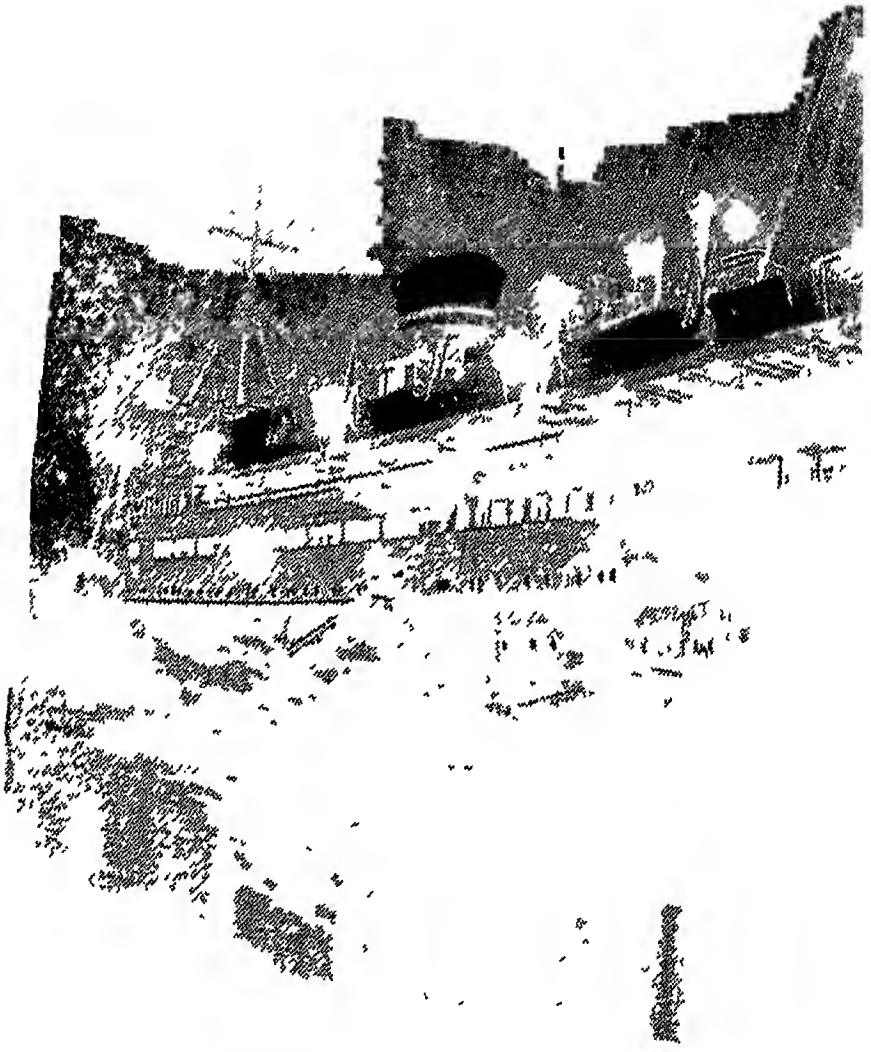
Other branches of commercial photography can sometimes be successfully exploited by the amateur. Catalogue illustrations and photographs of plans, medical or scientific subjects, museum exhibits, etc., are often required. There is no reason why the experienced amateur should hesitate to compete against professional photographers in this profitable field.

A novelty type of photograph that has great possibilities in India is the panoram. To do full justice to much of India's scenic beauty a wider angle of view than is obtainable with normal apparatus is required. Panoramic pictures can embrace any angle up to the full 360 degrees. Messrs. Kodak, Ltd, market the "Panoram Kodak", the 3a model of which gives a long narrow picture $3\frac{1}{4}$ by $10\frac{1}{2}$ inches. Or for the "Leica", "Contax", "Rolleiflex" and other miniature cameras, Messrs. Baird and Tatlock, Messrs. Agfa Photo. Co., Messrs Adair, Dutt and others, sell Panoramic Tripod Heads by means of which composite exposures of a panorama, up to a complete revolution, can be taken. These useful accessories for precision miniature camera owners are most reasonably priced at round about Rs. 12 and might prove a sound investment for the Indian amateur who is looking out for profitable sidelines.

A pictorial panoramic photograph of, say, the Himalayas from Darjeeling might become a commercial best-seller.

"IN COLOMBO HARBOUR " A telephoto lens is invaluable for far-distant subjects





' S S OCEANIA "

This picture was taken with a " Rolleiflex " twin-lens miniature reflex camera—an ideal type of instrument for night photography
(Reproduced by courtesy of Messrs Franke and Heidecke)

APPENDIX.

MISCELLANEOUS QUERIES.

(After parts of this book had appeared in article form, many readers wrote to me for additional information. As some of the points raised will be of interest to other amateur photographers in India, I think it worth while to reprint certain of the queries and answers here)

What is the secret of taking photos. of the "Snows" ? I have tried variations in exposures and stops, and have secured excellent photos of the foreground, but no sign of the "snows" in the background.

Your problem, as I understand it is to photograph distant mountain peaks. If these are a very great distance away, as I imagine from your letter, you are asking rather a lot of the lens fitted to your camera. It must be remembered that a lens of normal focal length, such as is fitted as standard to amateur cameras because of its suitability for all-round work, does not "see" as the eye does. The view before the lens is reproduced on the film on a very much reduced scale. Hence, there is a limit to the distance at which you can be from your object and yet secure detail on the film.

It would appear that you are very much beyond this limit. Generally speaking, stopping down the lens will improve definition, but it cannot work miracles. A tele-lens is the only solution to your problem. This will magnify the distant scene sufficiently to permit detail to be registered.

You must, of course, use a screen, and if you have a graded K2 screen this will mask the sky and snows, giving correct monochrome values, and still allow exposure for the foreground.

I have several unexposed films 2½ years old. They are securely packed. Can they still be used?

Provided they have not been exposed to damp, etc., they can be used and will probably give normal results. The date of development marked on modern films is usually about 18 months in advance of when they are bought. If used soon after the date printed on the carton no difficulties are likely to be encountered. When kept for a year beyond the due date, as in this instance, there is always a risk of fog and markings. You must, therefore, not be surprised if results are unsatisfactory.

What is the fastest photographic lens that it is possible to buy? Does the price of a lens depend on its speed?

Lenses of such extreme aperture as f.1.3 can now be bought for ciné or miniature still cameras. F.1.9 is about as large an aperture lens as it is possible to fit to any camera larger than V.P. Lenses of this aperture are available for 3½ by 2½, or even ¼-plate, cameras. Owing to the very shallow depth of focus at full aperture such lenses, however, have very frequently to be stopped down. Speed is not everything, although, if one can afford it, it always pays to buy the fastest lens available. One day, a picture may present itself that cannot be secured with anything but a super-speed lens.

Generally speaking, the price of a lens does depend on its aperture. A f.1.9 lens, for a $\frac{1}{4}$ -plate camera, would cost nearly ten times as much as a f.4.5 lens. Its actual price would not be far short of Rs. 750.

Is there a formula for removing the grain from an enlargement made from a miniature negative?—

Once the enlargement has been made nothing can be done. The point is to avoid coarsening the grain by careful treatment during exposure and development, and by using suitable films and paper. Under-exposure and over-development will always accentuate grain and under these circumstances it will often be apparent even when enlarging to three or four diameters. Subjecting the film to changes of temperature during development, fixing and washing is another thing to avoid

With modern fine-grain films, very big enlargements can be made without any trace of grain. Special fine-grain developers have now been placed on the market; they can be recommended and are most convenient for India.

Even when circumstances, unavoidable or otherwise, have resulted in coarsening of the grain, careful enlarging will minimise the defect. A diffusion disc in the enlarger is a great help in cases where the maximum degree of sharpness is not essential. The majority of miniature negative enlargers are specially constructed to minimise grain. Then it must be remembered that a glossy paper will reveal grain much more than a paper with a rough surface. Rough surface papers, however, will usually only be successful with broad pictorial effects. For other pictures a paper of silky texture will often be found most suitable.

What is "infinity"? This is marked but not given in feet on certain cameras. I want to scale my reflex camera. How do I calculate "infinity"?

This is quite simple in so far as the scaling of your camera is concerned. As you know, if a lens is focussed on a point at a certain distance from the camera *all* objects beyond half this distance will be sharply defined. This is called the "hyperfocal" distance of the lens and depends upon the focal length, the aperture and the degree of sharpness required in the picture. Thus, if we work out these distances for your 5½ inch f.4.5 lens, and also for your 12 inch f.5.6 tele-lens, we shall know on what points the lenses must be focussed to give sharp definition of distant objects. In other words we shall have found out at what setting the lens must be placed for infinity.

Considering a circle of confusion of 1-250 of an inch, the hyperfocal distances of the f.4.5 lens works out at 140 feet and that of the tele-lens at 535 feet. Therefore, when the lenses are focussed on objects at these distances, they will be at the infinity setting. All objects from half these distances to infinity will be sharply defined.

Will you please give some hints on "headings" to be submitted with competition "snaps"? What sort of title is appreciated—short or long?

The title depends to a certain extent on the type of entry you submit. Short "snappy" titles, however, are always preferred. A two-word title that aptly describes the picture is better than one of four words. If you are submitting a "human interest" snapshot you can sometimes work in a touch of humour. But it has got to be real humour and not a feeble attempt

at such A really outstanding title of this type might help your entry quite a lot. Competition editors like brightness and originality in titles just as they do in prints. For a more serious type of entry you want a more straightforward title but it can still be original, apt and brief. Brevity is where so many competitors fail. Study the titles appearing with prizewinning pictures and, while retaining your own originality of idea, model yours on the same lines.

What is "halation"? How can it be prevented?

In any print in which there is violent contrast between the high-lights and the shadows we often find a blurring round the former. This is called "halation" and is due to the reflection of a certain portion of the light rays from the back of the plate or from surrounding silver bromide grains. It is particularly noticeable in many indoor pictures in which an unscreened window is included. The blurred outline of the window encroaches on the surrounding shadow portion. It also frequently occurs in landscape work when dark objects are taken against a bright sky. The other day I came across a particularly glaring example which is of special interest to amateurs in India. A close-up portrait of a child wearing a white topee had been taken in brilliant sunshine and a full exposure (1-25 sec at f.6.3) had been quite rightly given to secure detail in those portions of the face that were in shadow. The result was that the white topee had been grossly over-exposed and the excessive strength of the light from the topee had resulted in halation which appeared as a bad blurring round the outline of the hat. Backed 'chrome film of the latest type had been used and the only way to avoid halation in this instance would have been to

take the child from much further away. Normally, however the latest films and plates with their special anti-halation backing and double emulsion enable the photographer to avoid this annoying trouble. Backed films or plates should always be used for dangerous subjects in which violent contrast is likely to occur. Much can often be done in arranging the subject to reduce the contrast. Something can also be done to improve a bad negative by local reduction in the dark-room and this is certainly worth while attempting if halation mars an otherwise good picture.

Certain photographic lens components are cemented, others are uncemented. Which type of lens is best? Does time impair the efficiency of a cemented lens?

Although there are many excellent uncemented lenses on the market, all the finest anstigmats today are of the cemented type. Uncemented lenses cost less to produce and are therefore fitted to the cheaper classes of cameras. They will give very good results but cannot be so highly corrected as cemented lenses. For technical reasons, uncemented lenses are not as a rule constructed to work at a very large aperture. F.6.3 is the usual aperture chosen although there are a few that work at f.4.5. Certainly, if money were no object, the experienced amateur would always choose a lens of the cemented type. With the very high standard reached in lens construction, there need be no anxiety with regard to the wearing qualities of the cement. As a matter of fact, it would not be a very serious matter if the cement did show signs of deterioration. This sometimes occurs with old lenses. Any first-class optician can re-cement and re-set the components.

Please give some hints on photography from aeroplanes? What type of camera, and what grade of plate, is most suitable for this work?

Except for record photography, it is advisable to take oblique views from aeroplanes, say at an angle of about 45 degrees from the horizontal. This gives a more pleasing view-point than would be the case if the camera were aimed straight down at the ground. Any type of folding camera can be used provided it is fitted with a fairly rapid shutter of the Compur or focal-plane type. A direct vision finder and a rapid lens are a great advantage. Ordinary types of reflex camera are unsuitable owing to their size and weight. At normal heights, say above 500 ft., although 1-200 sec. will be as a rule sufficient to avoid blurring, a reserve of speed is required to enable filters to be used. Haze is usually present in India and a filter used in conjunction with panchromatic plates or films will be required to penetrate it. For this reason I would always advise pan. material for aerial photography. Over-exposure must be avoided; a thin negative, packed with detail, is what we want for enlarging purposes.

There is one more important point. Vibration is the source of much trouble to the inexperienced aerial photographer. It would be fatal to rest the camera on any part of the fuselage. Hold the camera as firmly as possible in the hands and never attempt to steady it, or any part of the body, against the side of the cockpit. Only by the utmost care in this respect can blurring be avoided.

What is the slowest shutter speed that can be given with the camera in the hand? Is a tripod necessary for 1-10th sec. exposures?

For exposure times longer than 1-20th sec., the average amateur is well-advised to use a tripod or other firm support for the camera. Longer exposures can be given in the hand with certain instruments that have a very delicate shutter release. 1-5th sec. is often given in this way without any sign of blurring due to "camera shake." But such a slow speed as this can only be given by an experienced worker and even then there is a risk of movement. It is useful to practise making long instantaneous exposures with the camera in the hand but, when it comes to taking an important picture, the amateur is advised to use a tripod, whenever possible, at speeds below 1-20th. Only in exceptional circumstances should he attempt to go against this useful rule. This applies particularly to miniature cameras with which the sharpest definition is always required for the subsequent enlargements.

How are clouds "printed in" to landscape enlargements with a bare sky? Is it advisable for the amateur to attempt this work?

This process is not difficult, provided the cloud negatives are not too contrasty and vigorous, and it can certainly be carried out by the amateur with a little experience of printing and enlarging. Landscape pictures are immeasurably improved by the presence of suitable cloud effects. Unfortunately, Nature does not always arrange for such effects when we take our pictures and it therefore becomes necessary, especially in India, to print in from negatives specially taken for this purpose. As mentioned in Chapter V., the ideal type of cloud negative should be thin and well graded. For plate users, short exposures with soft-gradation pan-

chromatic plates will yield the sort of negative required. There are several methods employed to print in clouds. The most suitable for amateurs is as follows :—

Give the normal enlarging exposure for the landscape negative, remove the bromide paper from the enlarger and develop as usual. Then, instead of immersing in the fixing bath, rinse thoroughly in clean water and replace on the enlarging easel. With an orange cap on the enlarger lens, focus the cloud negative and cut out a rough black paper mask (the paper in which the bromide paper is wrapped does very well) to shield the landscape part of the print that has already been exposed and developed. There is no necessity to cut the mask mathematically accurate; if its outline approximately agrees with the horizon of the landscape this will be quite sufficient. Remove the safety cap from the lens, and, holding the mask just in front of the print, move it gently up and down during exposure, which must be on the short side, about 1-3rd of that given for the landscape. Movement of the mask during exposure is most important as otherwise there will be a visible dividing line between the landscape and the sky. Then develop for the sky, and fix and wash the whole print in the normal way.

It is important to choose a cloud negative that harmonises with the landscape scene. Here there is much scope for the photographer's originality and artistic sense, and a chance for him to prove that he possesses something more than mere technical ability in the dark-room.

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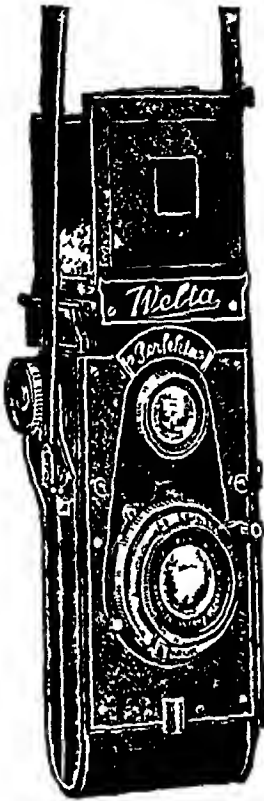
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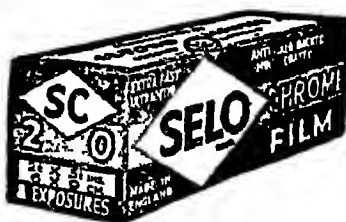
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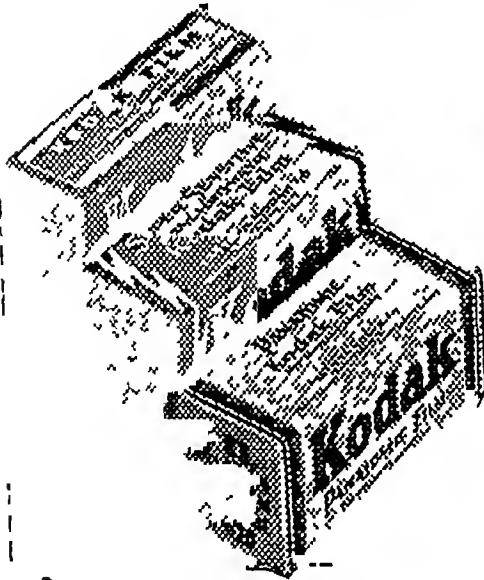
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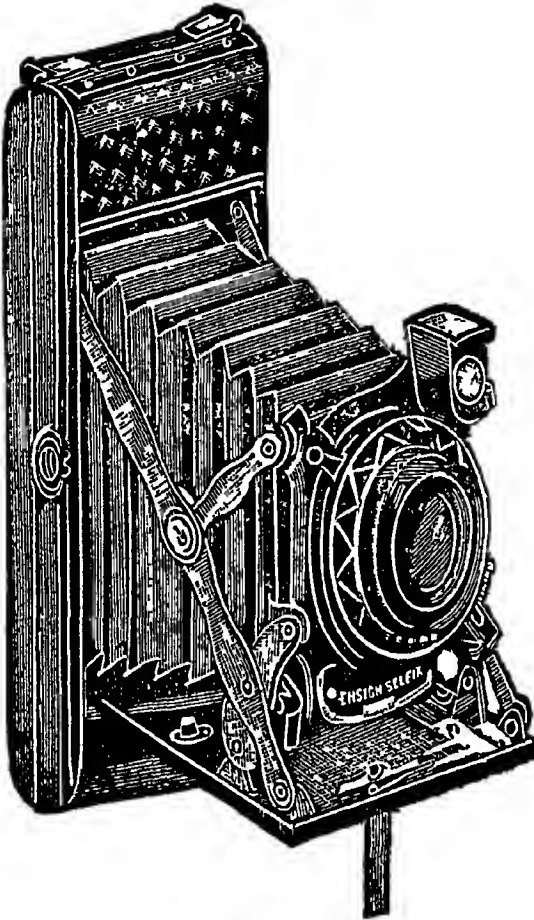
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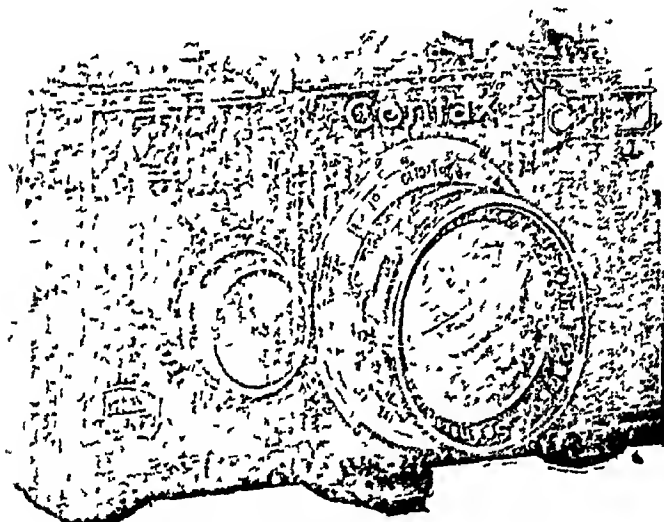
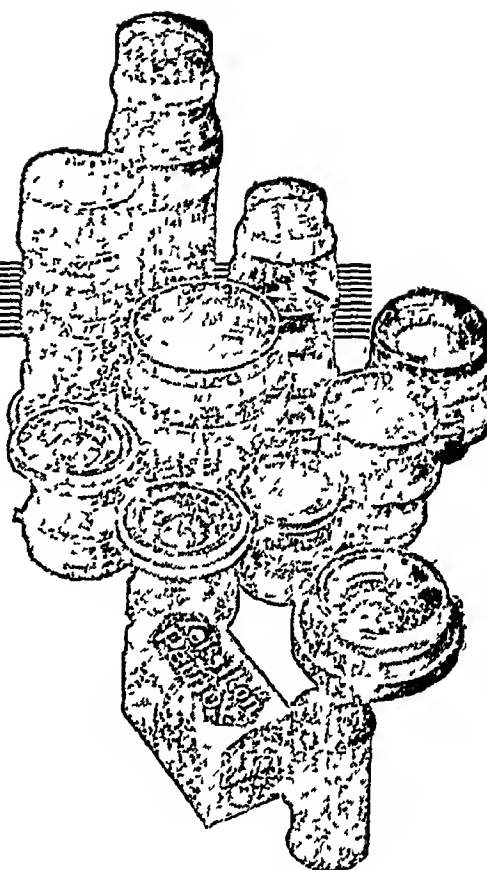
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